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NOVEMBER 1991

U.S. MIDRANGE SYSTEMS USER REQUIREMENTS

1991



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Customer Service Program (CSP)

***U.S. Midrange Systems User Requirements,
1991***

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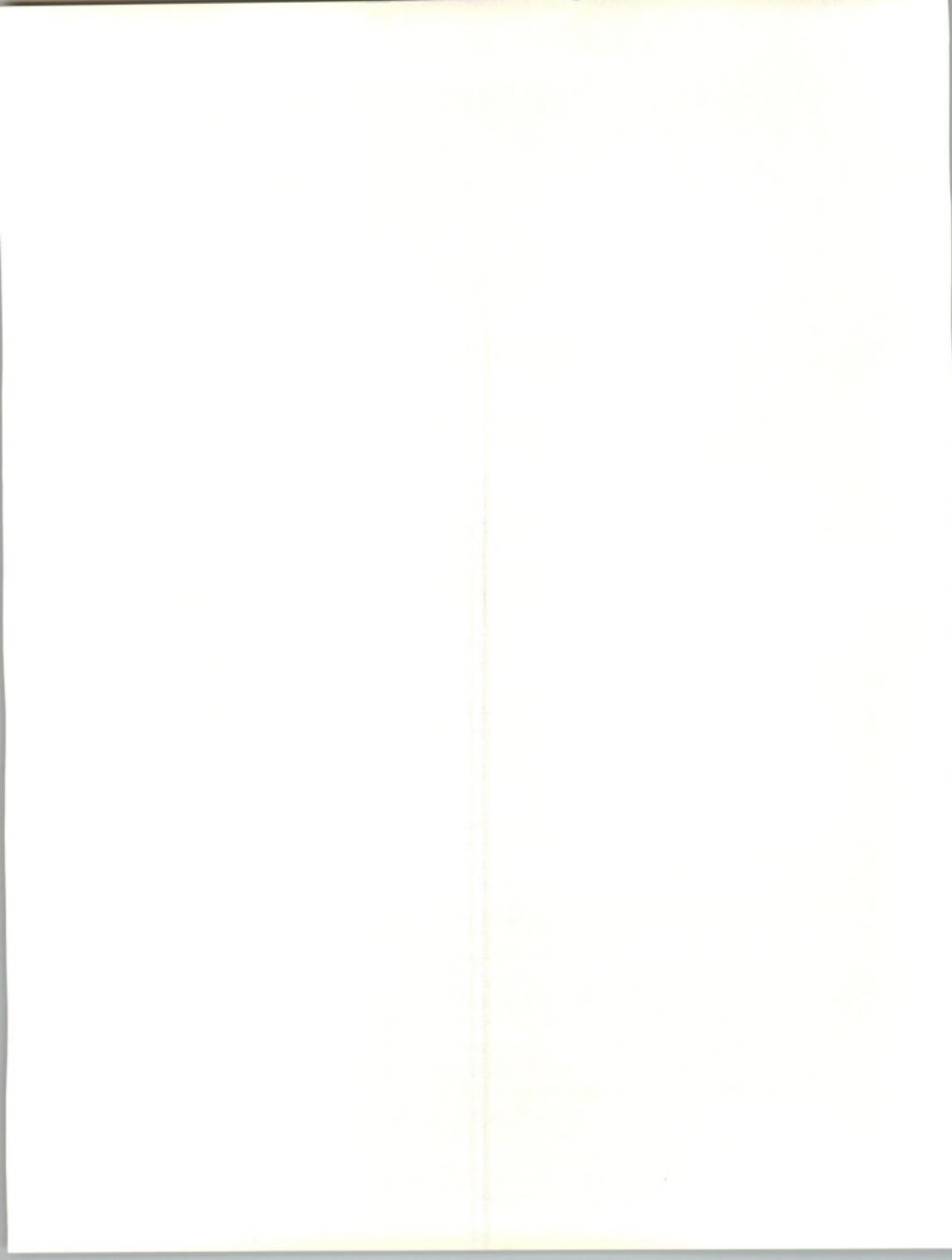
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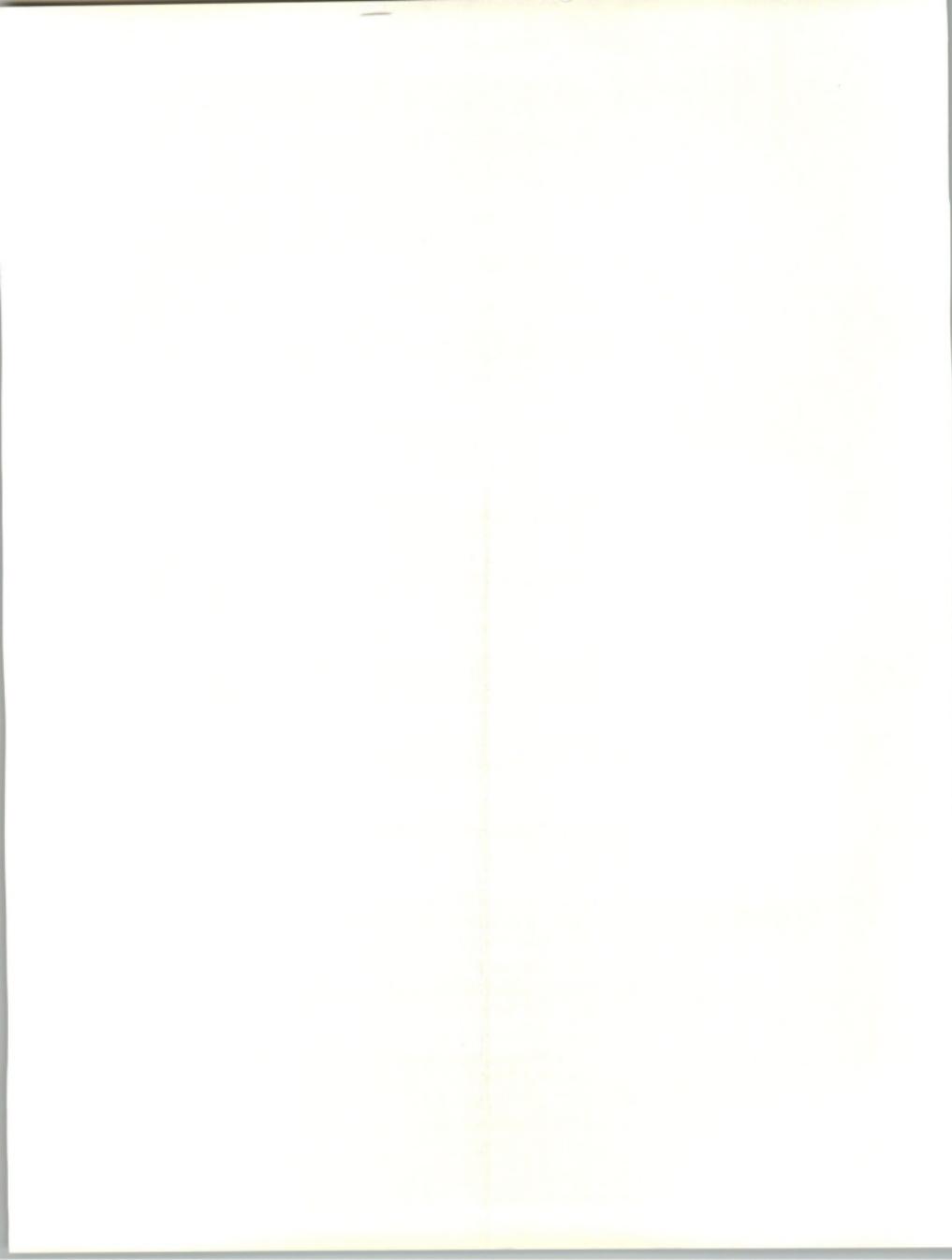
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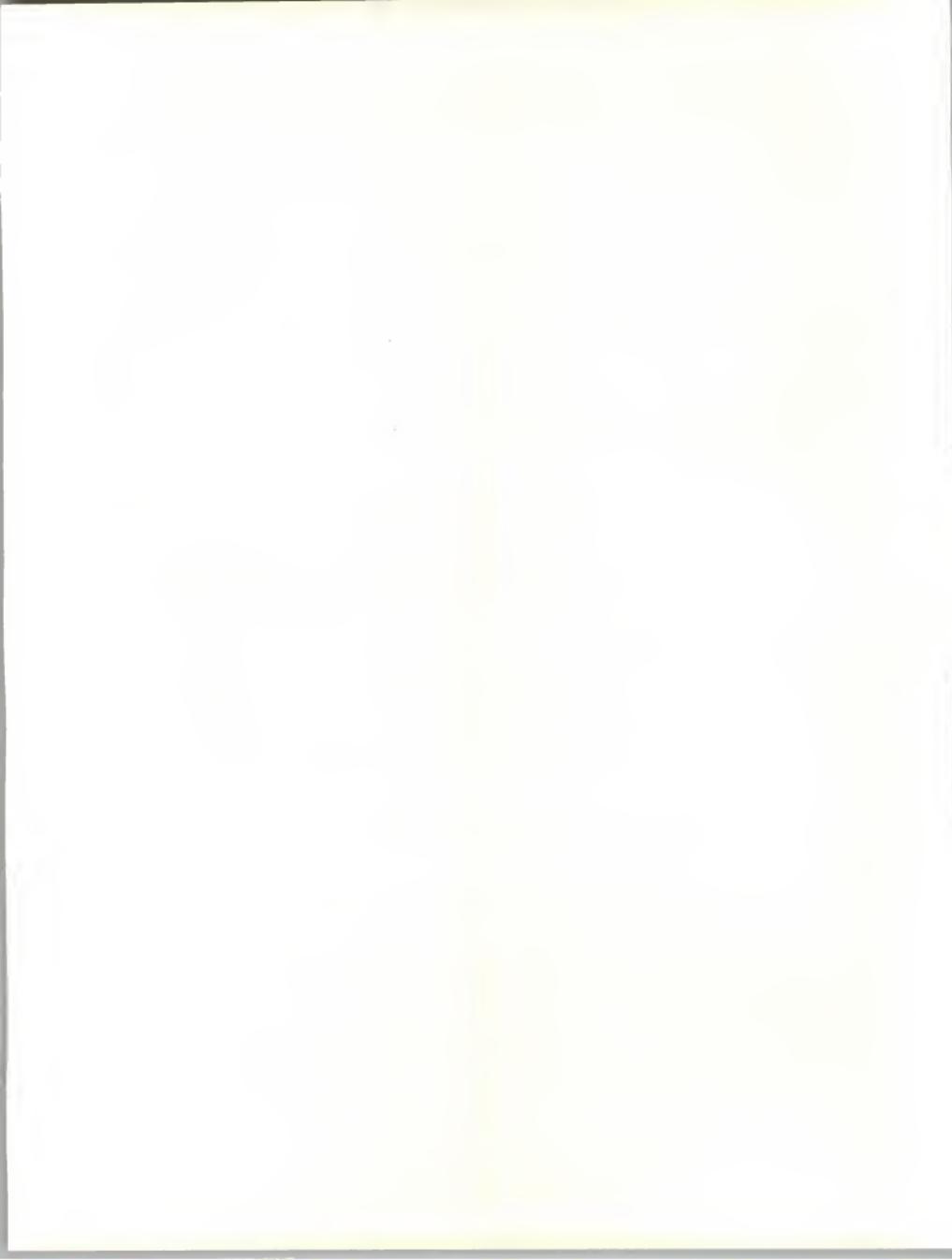
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Introduction



I

Introduction

This report presents midrange system user requirements for and satisfaction with the service and support they receive from their service vendors. The report also analyzes users' requirements for services that are ancillary to the actual maintenance of the computer system.

A --- Scope

The report examines the service requirements of users of the following midrange systems: Data General, DEC VAX/MicroVAX, Hewlett-Packard 3000, IBM 937X, and IBM AS/400. Exhibit I-1 provides a breakdown of the manufacturers included in the sample.

EXHIBIT I-1

User Sample by Vendor

Vendor	Completed Interviews
Data General	32
DEC	31
HP 3000	32
IBM 937X	31
IBM AS/400	30
Total Sample	156



Each vendor/product analysis includes:

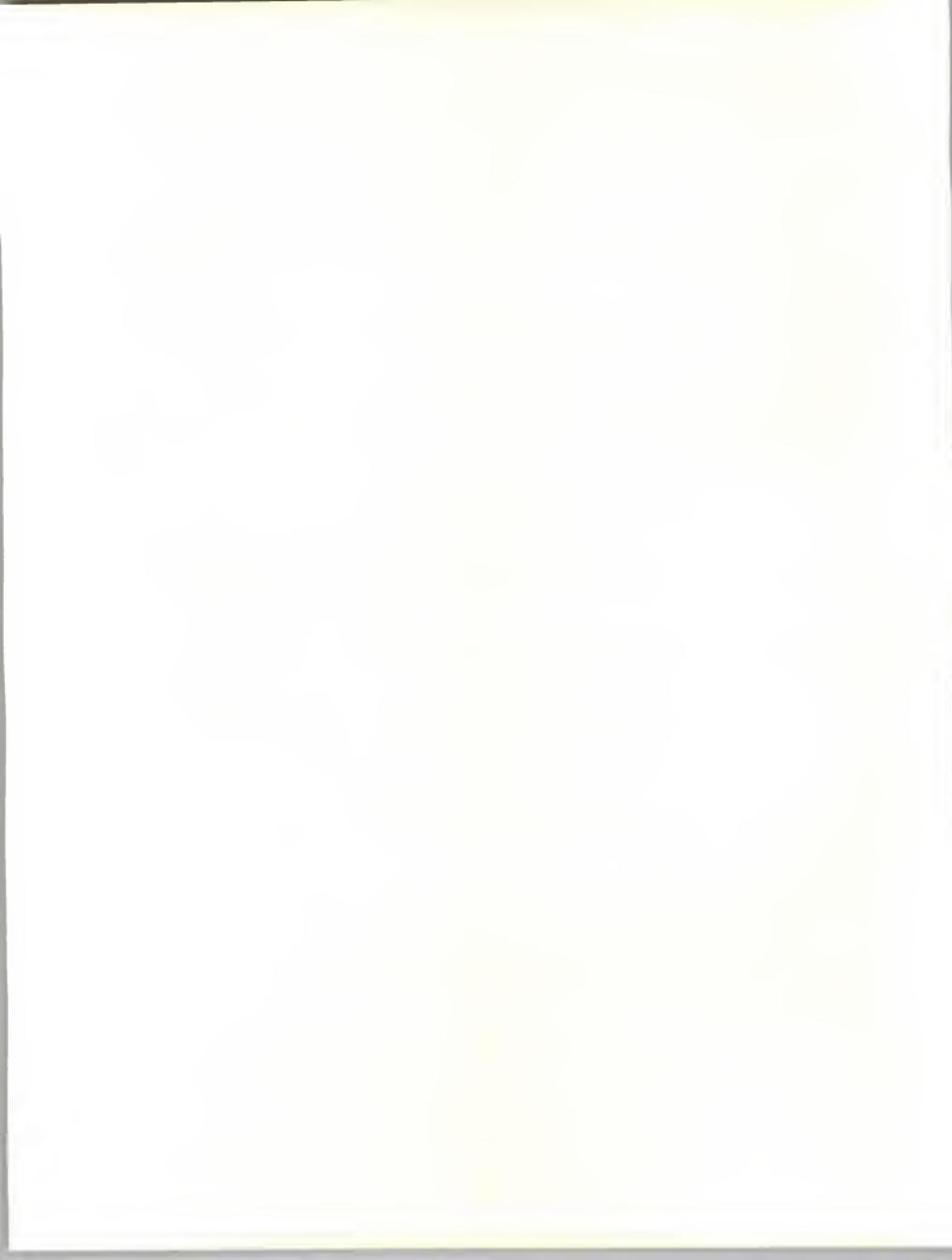
- Service contract coverage, both days per week and hours per day
- Users' criteria for selecting a service vendor
- Service contract type
- Type of vendor providing service
- Perceptions of independent maintenance organizations, and why they are used or not used
- Traditional areas of system availability, response time, repair time and aspects of hardware service
- System software support areas, type of vendor, type of contract
- Aspects of systems software support
- Response/fix time for software problems
- Opportunities for other ancillary services
- Percent of users receiving multivendor service and the expected level of interest in three years in multivendor service and single point of contact service
- Current use of discounts and willingness of users to investigate discounts not currently received

The report is presented in four chapters. Chapter I provides an introduction to the report, the scope, methodology, interpretation of data, and data presentation. Chapter II is an overview of the midrange systems sample. Chapter III provides individual analyses by product vendor. Wherever possible, comparisons will be made to the information presented in the report *U.S. Midrange Systems User Requirements, 1990*, or to the sample as a whole. Chapter IV provides comparative exhibits, examining each area by vendor. Appendix A provides the questionnaire used for the user research.

B

Methodology

For this report, INPUT surveyed 156 users of midrange systems in the U.S. as to their requirement for and satisfaction with the service they receive. Each interview was conducted by telephone or fax using the questionnaire in Appendix A. INPUT targets the appropriate systems executive with responsibility for coordinating the maintenance of the system. Typical



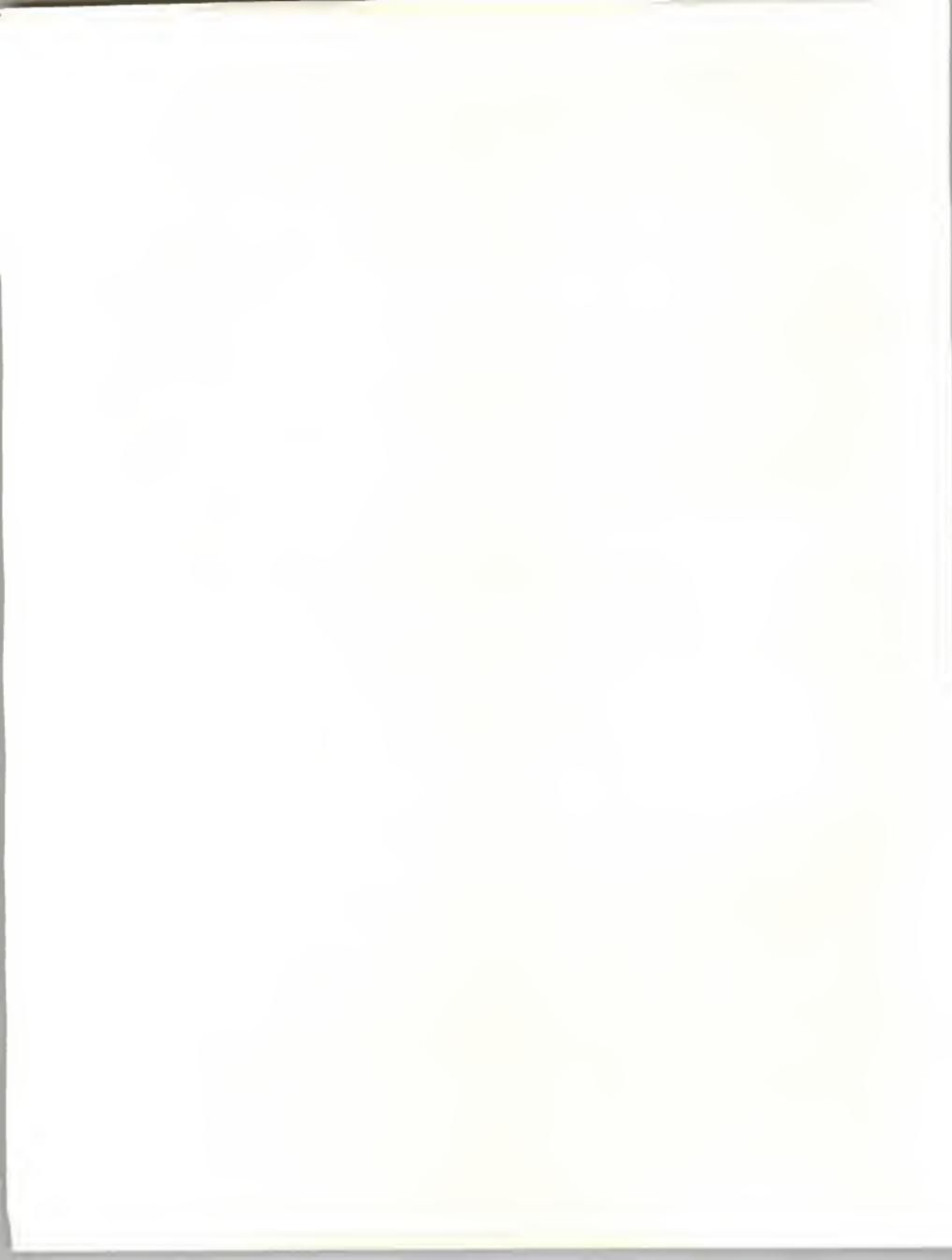
titles include Data Processing Manager, IS Director or Manager, Data Center Manager, or Vice President of IS. The companies interviewed represent a variety of industries, as shown in Exhibit I-2.

EXHIBIT I-2

User Sample by Industry Sector

Industry	Respondents
Manufacturing	38
Distribution	12
Transportation	4
Utilities	5
Banking/Finance	16
Education	18
Insurance	7
Telecommunications	1
Services	22
Medical	12
Federal Government	12
State/Local Government	12
Other	4
Total	163

INPUT emphasizes the value of telephone interviews over other types of research-gathering techniques because of the ability of the interviewer to focus the respondent and control the source of information and the size of the sample. The questionnaire was faxed to many respondents who wished to see the full questionnaire before responding to it.



After the data-gathering process was complete, the information was entered into a dBase III Plus (Ashton-Tate) data base and analyzed using ABstat (Anderson Bell). Quality control measures are applied at each step to ensure data integrity.

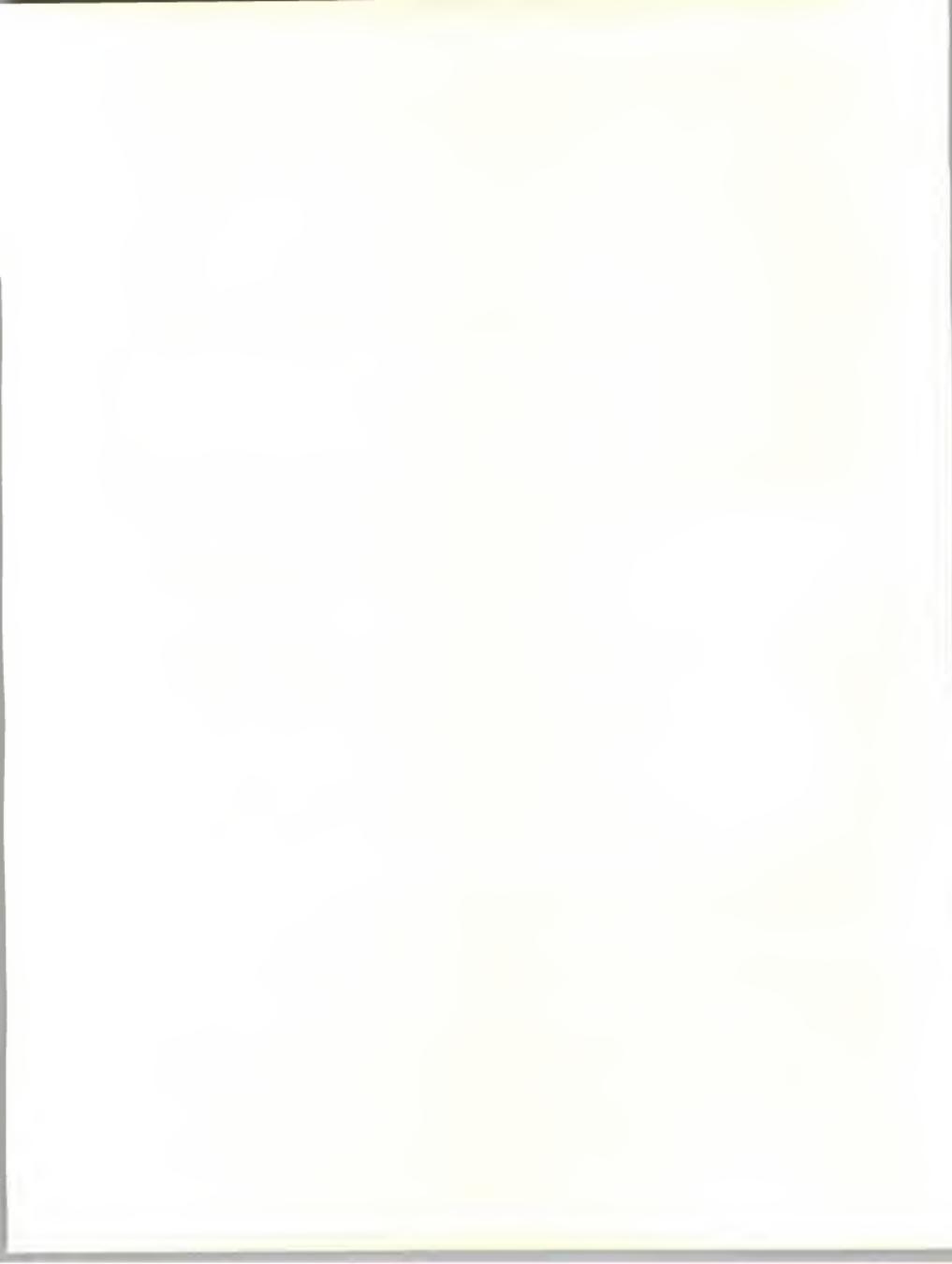
C**Interpretation of Data**

Mean values are used throughout the tabulated data presented in this report. These means refer to the mean value of user ratings for specific aspects of service performance, or the mean value of a range of service performance required or received by the respondents.

In this report, the ratings for service requirements ranged from 1 to 10, with 1 equal to a very low requirement or satisfaction and 10 being an extremely high requirement or satisfaction. In some cases, 0 was used to denote no requirement for service or a service not received at all from the vendor.

For the purposes of this report, the following definitions apply:

- System availability refers to the time the system is actually available for processing, disregarding non-critical peripheral outages or normal preventive maintenance downtime.
- Response time is the time between the placement of a service call to the vendor and the arrival of the service engineer on site.
- Repair time relates to the time the service engineer spends working on the system until it is fully operational.
- Difference is a comparison of the mean service required with the mean service received. A negative number denotes a shortfall in the service received. A positive number denotes the mean service received exceeding the mean service required.
- Percent satisfied is based on whether the service received met or exceeded service required for each individual respondent. A count is made of how many individuals had their requirements met or exceeded for that particular service requirement; this converts to the percent satisfied.



D**Data Presented**

For each of the six user sections (Midrange Systems, Data General, DEC VAX/MicroVAX, Hewlett-Packard 3000, IBM 937X, and IBM AS/400) of this report, the following fifteen exhibits will be presented:

Exhibit 1 - Contract Coverage presents the days-per-week and hours-per-day maintenance coverage as reported by the respondents.

Exhibit 2 - Service Vendor Selection Criteria analyzes the importance of certain criteria in selecting a service vendor.

Exhibit 3 - Hardware Maintenance Provider presents the reported sources of service used by the sample to provide required maintenance on their hardware. Multiple sources of hardware maintenance service are allowed.

Exhibit 4 - Reasons IMO Not Used present the reasons why users do not use an IMO as part of their maintenance plan for equipment.

NOTE: When applicable, a special Exhibit 4A (*Reasons for IMO Use*) is included to describe issues relating to why users have an independent maintenance organization as part of their maintenance plan.

Exhibit 5 - Maintenance Contract Terms provides information on the length of contracts or types of maintenance contracts held by the sample.

Exhibit 6 - System Availability Performance Analysis examines the mean system availability, response time and repair time required by the sample; the system availability, response, and repair times received; and the percent of users having their requirements met or exceeded.

Exhibit 7 - System Failure Rates are presented, giving the mean number of failures per year, and the mean percentages for the approximate causes of the failures.

Exhibit 8 - Hardware Service Required versus Received examines six individual aspects and overall hardware maintenance service as to the level of service required, the level received, satisfaction with service and the percent of respondents having their requirements met or exceeded.

Exhibit 9 - Software Maintenance Provider presents the sources used by the sample to provide system software support. Multiple sources are recorded where applicable.

Exhibit 10 - System Software Maintenance Contract Terms presents the types of service contracts held by the respondents to support system software.



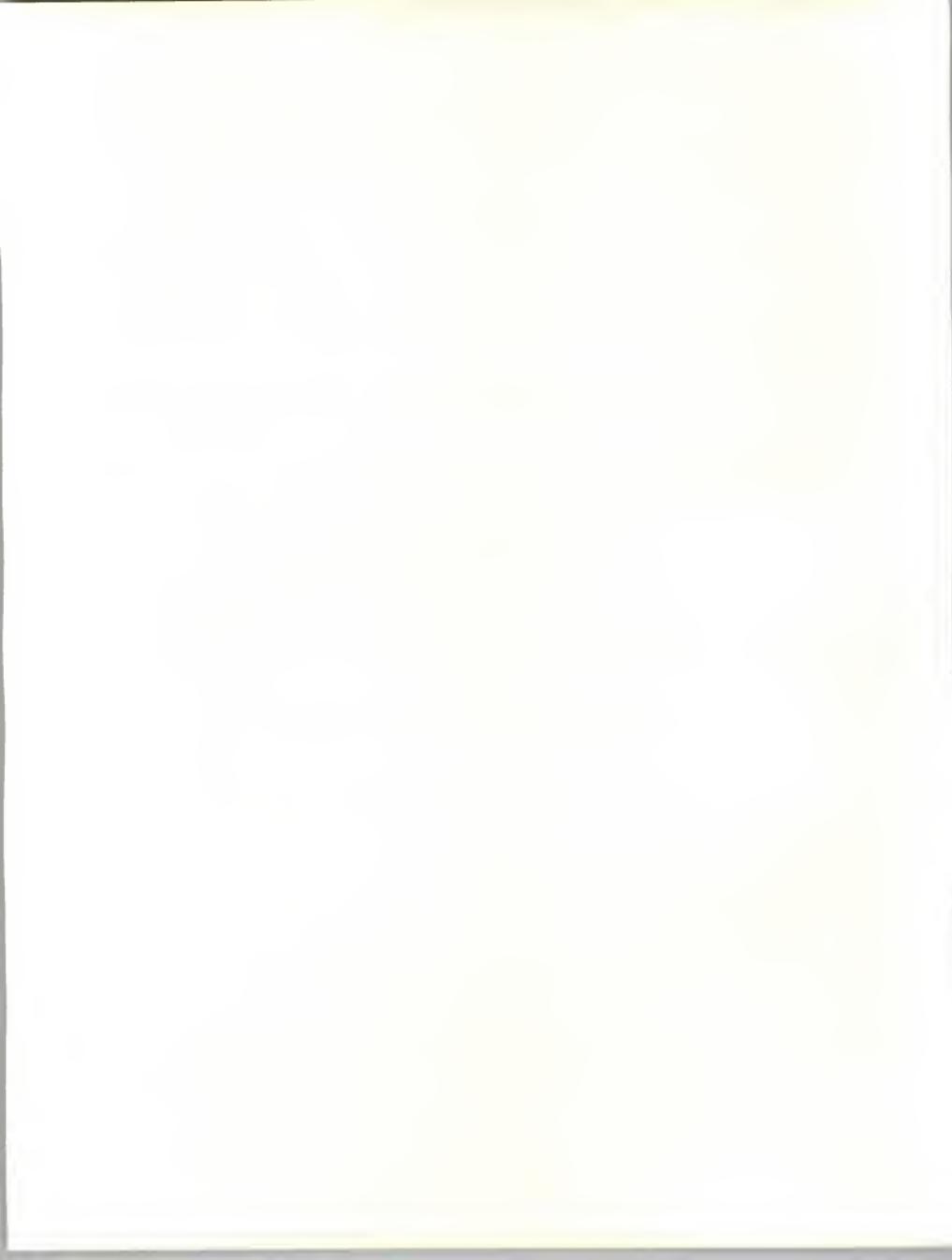
Exhibit 11 - *System Software Problem Resolution* provides information on the resolution of system software problems, on site and over the phone. The exhibit also covers the percent of respondents that had their software support requirements met or exceeded in the issues of response time and fix time on software problems.

Exhibit 12 - *System Software Support Required versus Received* examines six aspects and overall system software support as to the level of support required by the respondents, the level received, mean satisfaction with system software support and the percent of users having their requirements met or exceeded.

Exhibit 13 - *Ancillary Services* presents information on the current market for other services ancillary to the maintenance function and the possibility for expansion of these services. Information is presented on the number of respondents currently receiving these services, their mean requirement, mean level received, and the percent of respondents having their requirements met or exceeded.

Exhibit 14 - *Multivendor Services* examines the percent of respondents receiving multivendor services on their CPU, peripherals, and network products. The level of interest in multivendor services in three years and the interest in single-point-of-contact service is also presented.

Exhibit 15 - *Discounts* shows the percent of respondents currently receiving discounts for reduced levels of service or special contractual arrangements and the interest in these discounts by those not receiving them at this time.



II

Midrange Systems Summary



II

Midrange Systems Summary

The overall 1991 midrange systems sample consists of 156 users of Data General, DEC, HP 3000, IBM 937X, and IBM AS/400 midrange systems. Data for the user group as a whole is presented with the following key highlights:

- There is a greater percentage of users reporting extended 7 X 24 coverage for their midrange systems than in past years.
- Service quality issues rated higher in mean importance when selecting a service vendor. In the mid- to late-1980s, price and quality of service alternated, with quality remaining the steady issue for the last three years.
- There was a small number of users who used an IMO as part of their service scheme (11 out of 156). The main reasons given by the respondents include lower cost, local service, and a more flexible contract.
- The major reasons given by respondents not using an IMO were satisfaction with the manufacturer and the technological advantage of the manufacturer.
- The mean level of system availability dropped from that of the 1990 midrange sample, with the percent of respondents receiving their required level dropping from 69% to 60%.
- Overall, there appears to be a greater requirement for ancillary services. Except in the area of facilities management, over 55% of the respondents expressed some need for ancillary services. The percent of respondents who actually received some level of ancillary service from their vendors ranged from 28% to 76% of the total sample of midrange users.
- Less than 25% of the midrange users reported receiving any type of multivendor service from their service vendor. Only 9% reported receiving service on other manufacturers' CPUs, with their mean level of interest in receiving these services ranging from 2.3 to 2.8 on a scale of 1 - 5.

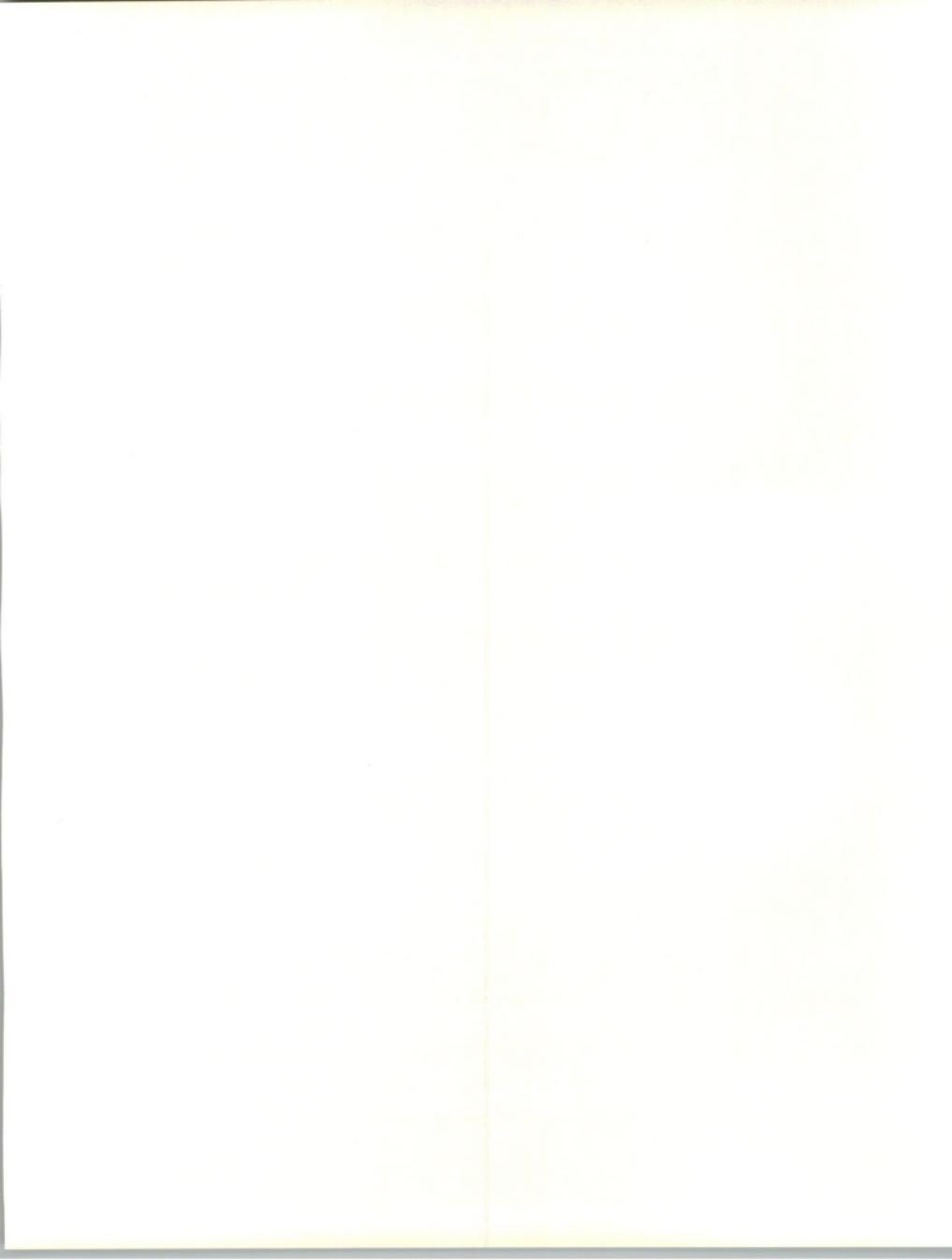


EXHIBIT II-1

**Contract Coverage
Midrange Systems**

	Percent of Sample	
	1991	1990
<u>Days Covered</u>		
Monday - Friday	37	61
Monday - Saturday	3	5
Monday - Sunday	60	34
<u>Hours Covered</u>		
1 - 9	29	53
10 - 16	15	12
17 - 24	56	35

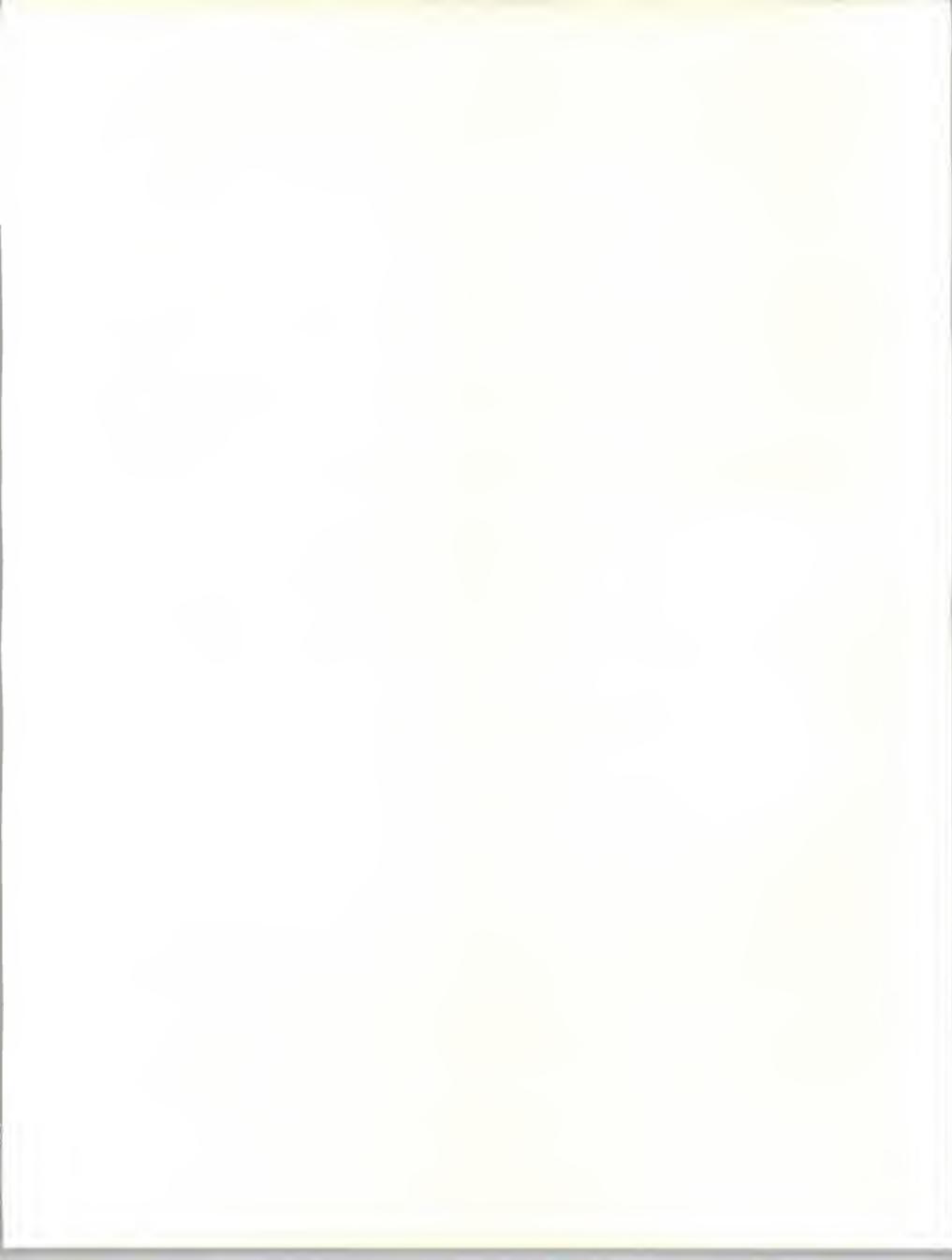
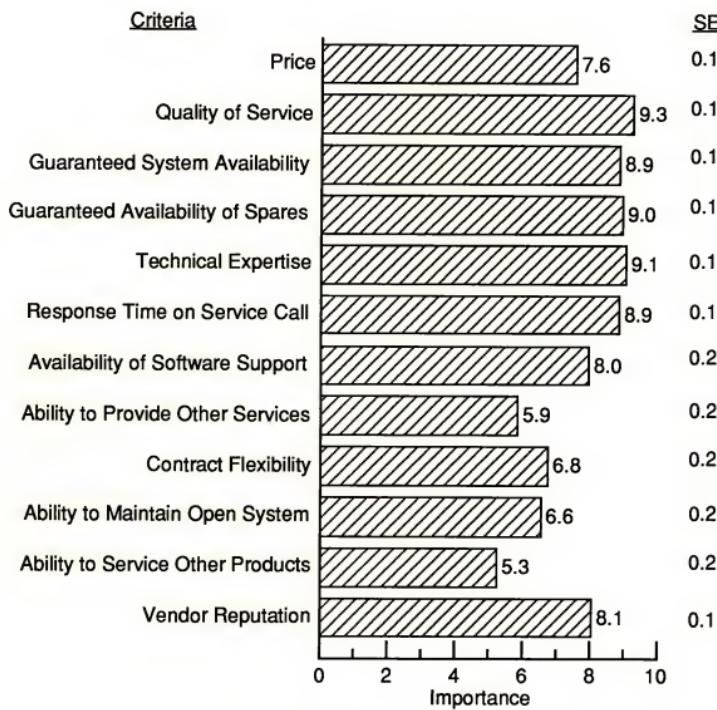


EXHIBIT II-2

Service Vendor Selection Criteria
Midrange Systems



SE: Standard Error of the Mean.



EXHIBIT II-3

**Hardware Maintenance Provider
Midrange Systems**

Provider	Percent of Mentions	Primary
Manufacturer	94	93
Dealer/Distributor	1	0
Independent Maintenance Organization	8	6
In-House	3	1
Other	2	0

Multiple Responses Allowed.



EXHIBIT II-4

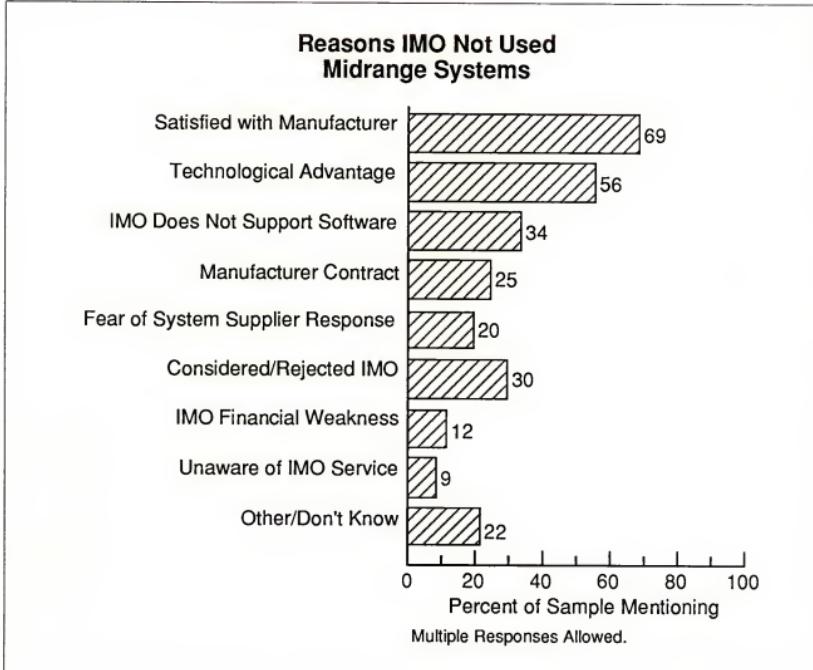
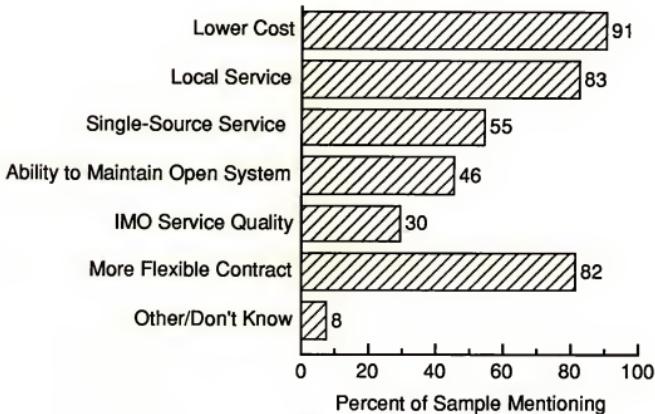




EXHIBIT II-4A

**Reasons for IMO Use
Midrange Systems**

Multiple Responses Allowed.

Sample = 11



EXHIBIT II-5

**Maintenance Contract Terms
Midrange Systems**

Hardware Maintenance	Percent of Respondents
Warranty	3
Five Years	14
Three Years	13
One Year	59
Time and Materials	2
Other	9
None	0

EXHIBIT II-6

**System Availability Performance Analysis
Midrange Systems**

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	96.5	96.0	60
Response Time (hrs.)	4.4	3.4	90
Repair Time (hrs.)	4.3	3.5	82



EXHIBIT II-7

System Failure Rates Midrange Systems

Mean Failures Per Year	3.3
<u>Causes of Failure (%)</u>	
Hardware	58
Systems Software	14
Applications Software	3
Other	25

Sample: 144

EXHIBIT II-8

Hardware Service Required versus Received Midrange Systems

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	8.8	8.4	8.7	64
Engineer Skills	9.1	8.8	8.9	70
Documentation of Maintenance	7.1	7.5	8.1	80
Help Desk Support	7.7	7.6	8.1	75
Remote Diagnostics	7.3	7.6	8.2	84
Real-Time Software Diagnostics	7.3	6.9	7.3	69
Overall Hardware Maintenance	9.2	8.8	8.9	66

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT II-9

Software Maintenance Provider
Midrange Systems

Provider	Percent of Mentions
Hardware Manufacturer	79
Other Hardware Service Provider	2
Software Product Vendor	12
Value-Added Reseller (VAR)	4
In-House	34
Other	7

Multiple Responses Allowed.

EXHIBIT II-10

**System Software
Maintenance Contract Terms**
Midrange Systems

Software Maintenance	Percent of Respondents
Included in License Fee	31
Three-Year	3
One-Year	35
Custom	10
None	8
Don't Know	13



EXHIBIT II-11

System Software Problem Resolution
Midrange Systems

Solved by Phone (%)	80
Elapsed Time (hrs.)	6.9
<u>Other Problems</u>	
Response Time	
• Required (mean hrs.)	11.6
• Received (mean hrs.)	10.8
• Percent Satisfied	86
Fix Time	
• Required (mean hrs.)	8.3
• Received (mean hrs.)	7.1
• Percent Satisfied	88



EXHIBIT II-12

**System Software Support Required versus Received
Midrange Systems**

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	8.9	8.1	8.2	60
Documentation	8.6	7.6	7.8	48
Software Installation	8.2	7.4	8.0	64
Provision of Updates	8.3	7.9	8.1	69
Operational Training	6.8	6.2	7.2	64
Software Remote Support	7.7	7.5	7.9	75
Software Support Overall	8.8	8.1	8.1	57

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT II-13

Ancillary Services
Midrange Systems

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	91	6.8	7.1	73	30
Capacity Planning	91	7.0	6.9	62	30
Environmental Planning	71	6.0	6.5	81	25
Cabling	75	6.6	7.0	77	25
Software Evaluation	72	6.6	6.3	63	26
Maintenance-Related Training	68	5.9	5.9	70	25
Install/Deinstall/Move	119	7.5	7.8	79	9
Consulting	92	6.9	6.9	73	13
Network Planning	85	6.7	6.4	60	23
Network Management	70	6.3	6.0	60	23
Disaster Recovery	67	7.0	5.9	58	32
Facilities Management	43	5.5	5.3	79	28
Problem Management	72	6.7	6.5	63	19
Applications Software Support	81	6.9	6.6	52	24



EXHIBIT II-14

Multivendor Services Midrange Systems

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	9	2.3
Peripherals	23	2.7
Network Products	14	2.8
<u>Level of Interest</u>		
Single Point of Contact	3.6	

Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT II-15

Discounts Midrange Systems

	Percent Receiving	Mean Willingness to Receive
Multiyear	49	5.5
Prepayment	38	4.5
Call Screening/Problem Management	13	4.5
Deferred Response	13	3.8

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest







Vendor Performance Data



III

Vendor Performance Data

Chapter III presents the individual vendor/product analyses for Data General, DEC VAX/MicroVAX, HP 3000, IBM 937X, and IBM AS/400 midrange systems.

A

Data General

The Data General sample consisted of 32 users of the Data General MV midrange systems. In the analysis of the Data General information, the following points are noteworthy:

- Service issues of quality, technical expertise, spare parts, and system availability rated highest in terms of evaluating service vendors. Price had a higher mean rating for the Data General sample as opposed to other midrange systems, but ranked sixth in selection criteria importance.
- The percent of users receiving their required level of system availability dropped significantly—from 61% of the 1990 sample to 29% of the 1991 sample. Response time satisfaction percent stayed approximately the same, but repair time also dropped from 91% receiving their required repair time or less to 76% in 1991 receiving a satisfactory repair time.
- The mean failures per year also increased from 3.3 in the 1990 study to 5.6, with an increase in the mean percent of the failures due to hardware problems.
- The analysis of hardware service shows that only 41% of the Data General users received their required level of overall hardware support or better. Forty-four percent of the users had their requirements for spares availability met or exceeded.



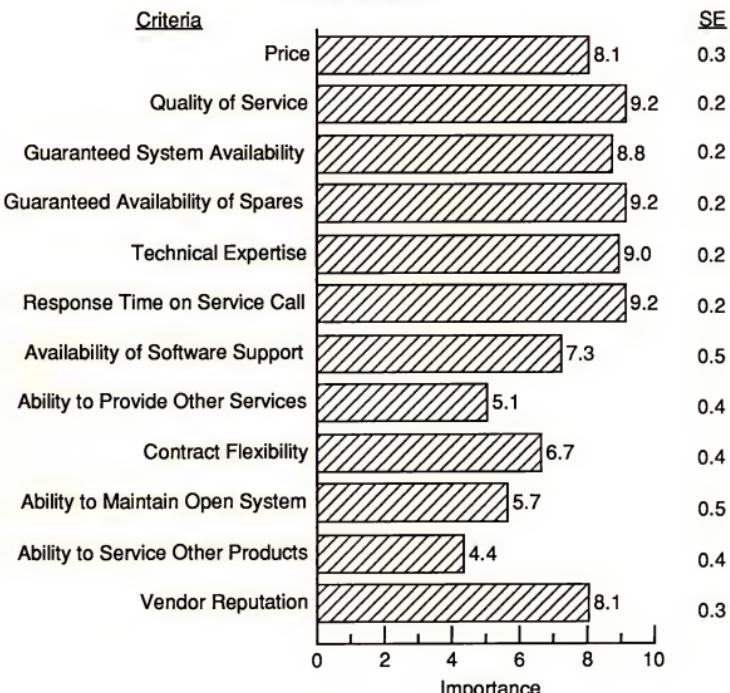
EXHIBIT III-A-1

**Contract Coverage
Data General**

	Percent of Sample	
	1991	1990
<u>Days Covered</u>		
Monday - Friday	66	68
Monday - Saturday	0	9
Monday - Sunday	34	23
<u>Hours Covered</u>		
1 - 9	47	64
10 - 16	25	13
17 - 24	28	23



EXHIBIT III-A-2

Service Vendor Selection Criteria
Data General


SE: Standard Error of the Mean.



EXHIBIT III-A-3

**Hardware Maintenance Provider
Data General**

Provider	Percent of Mentions	Primary
Manufacturer	97	100
Dealer/Distributor	3	0
Independent Maintenance Organization	9	0
In-House	3	0
Other	0	0

Multiple Responses Allowed.



EXHIBIT III-A-4

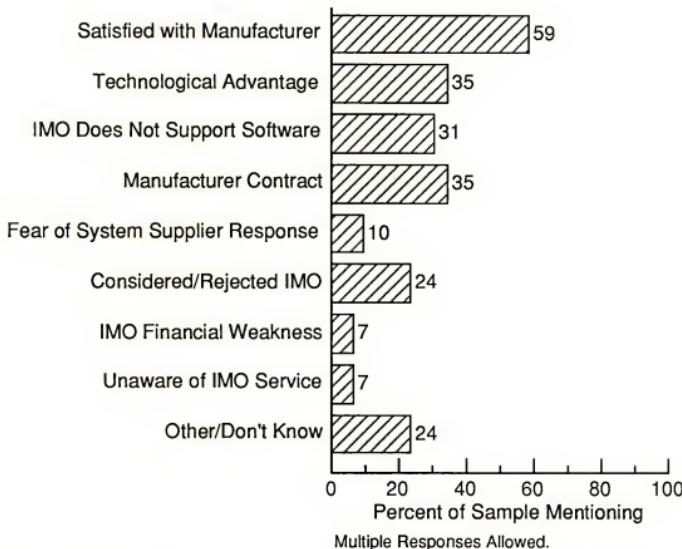
**Reasons IMO Not Used
Data General**



EXHIBIT III-A-5

**Maintenance Contract Terms
Data General**

Hardware Maintenance	Percent of Respondents
Warranty	0
Five Years	16
Three Years	31
One Year	53
Time and Materials	0
Other	0
None	0

EXHIBIT III-A-6

**System Availability Performance Analysis
Data General**

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	97.3	94.4	29
Response Time (hrs.)	6.6	6.4	85
Repair Time (hrs.)	4.9	4.5	76



EXHIBIT III-A-7

System Failure Rates Data General

Mean Failures Per Year	5.6
------------------------	-----

Causes of Failure (%)

Hardware	65
----------	----

Systems Software	10
------------------	----

Applications Software	0
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Other	25
-------	----

Sample: 32

EXHIBIT III-A-8

Hardware Service Required versus Received Data General

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	9.2	8.0	8.3	44
Engineer Skills	9.3	8.8	8.8	66
Documentation of Maintenance	7.2	7.3	7.8	74
Help Desk Support	7.3	7.4	7.7	63
Remote Diagnostics	7.4	8.3	8.4	77
Real-Time Software Diagnostics	7.2	6.2	7.1	47
Overall Hardware Maintenance	9.5	8.4	8.5	41

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT III-A-9

**Software Maintenance Provider
Data General**

Provider	Percent of Mentions
Hardware Manufacturer	53
Other Hardware Service Provider	3
Software Product Vendor	22
Value-Added Reseller (VAR)	7
In-House	41
Other	3

Multiple Responses Allowed.

EXHIBIT III-A-10

**System Software
Maintenance Contract Terms
Data General**

Software Maintenance	Percent of Respondents
Included in License Fee	41
Three-Year	6
One-Year	25
Custom	3
None	22
Don't Know	3



EXHIBIT III-A-11

**System Software Problem Resolution
Data General**

Solved by Phone (%)	73
Elapsed Time (hrs.)	6.5
<u>Other Problems</u>	
Response Time	
• Required (mean hrs.)	12.5
• Received (mean hrs.)	9.4
• Percent Satisfied	75
Fix Time	
• Required (mean hrs.)	6.6
• Received (mean hrs.)	6.9
• Percent Satisfied	90



EXHIBIT III-A-12

**System Software Support Required versus Received
Data General**

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	8.9	8.2	8.6	57
Documentation	8.7	7.1	7.4	32
Software Installation	7.9	7.1	8.1	68
Provision of Updates	8.5	7.5	8.1	60
Operational Training	7.1	5.9	7.2	55
Software Remote Support	8.0	7.5	8.3	70
Software Support Overall	8.9	8.3	8.3	58

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT III-A-13

Ancillary Services
Data General

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	13	6.8	7.2	62	16
Capacity Planning	16	7.1	7.0	63	13
Environmental Planning	9	6.2	6.4	56	11
Cabling	13	6.9	6.9	42	14
Software Evaluation	14	6.9	7.1	57	10
Maintenance-Related Training	13	6.5	7.1	62	10
Install/Deinstall/Move	27	8.1	8.1	73	1
Consulting	19	6.8	6.8	74	5
Network Planning	15	6.6	5.6	53	8
Network Management	13	6.1	5.2	46	9
Disaster Recovery	9	7.7	6.6	56	15
Facilities Management	6	6.1	5.8	50	11
Problem Management	14	7.3	7.4	50	8
Applications Software Support	16	7.7	6.6	31	11



EXHIBIT III-A-14

Multivendor Services Data General

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	13	1.9
Peripherals	22	2.4
Network Products	9	2.3
<u>Level of Interest</u>		
Single Point of Contact	3.6	

Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT III-A-15

Discounts Data General

	Percent Receiving	Mean Willingness to Receive
Multiyear	68	5.1
Prepayment	35	3.1
Call Screening/Problem Management	20	3.6
Deferred Response	16	3.3

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest



B**DEC**

The DEC sample consisted of 31 users of DEC VAX and MicroVAX midrange systems. The following points appear significant in the DEC information:

- There has been a slow steady move over the last three years to expand contractual maintenance coverage. This reflects the expanded role of midrange equipment in the enterprise. As the criticality of the application increases, so do the demands on the equipment and the necessity of high system availability, resulting in increased maintenance coverage.
- Overall, the mean ratings of importance of all service selection criteria increased. The rankings of the mean ratings stayed about the same, with the issues of quality of service, technical expertise, spares availability, and system availability being the top four.
- Satisfaction with the manufacturer and the technological advantage of the manufacturer were given most often as the reasons why users stayed with manufacturer service. Lower cost, local service, single-source service, and more flexible contracts were reasons for respondents' use of independent maintenance as part of their service plan.
- Almost every respondent in the DEC user group that had a requirement for ancillary services received some level of service from their maintenance vendor.
- Forty-two percent of the DEC respondents received service on other vendors' peripherals, with other multivendor services being received by less than 30% of the respondents.



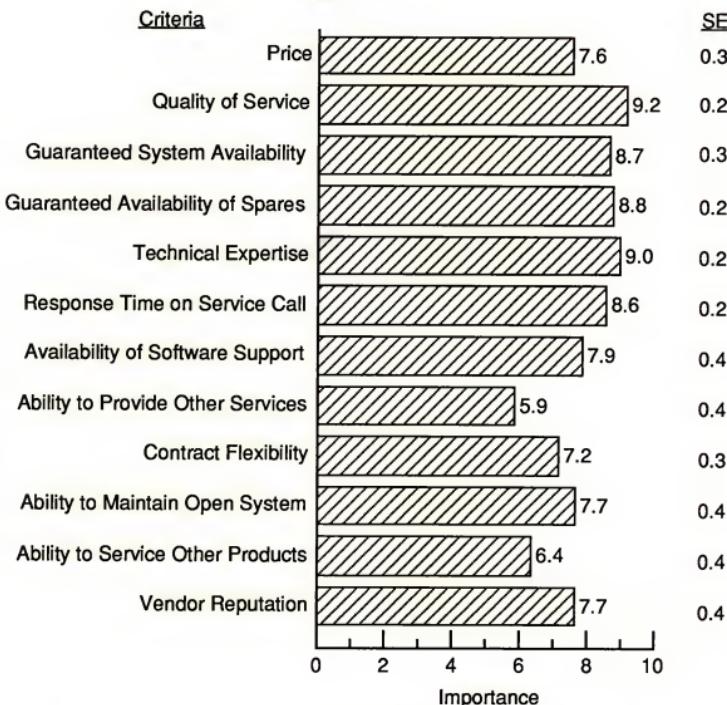
EXHIBIT III-B-1

**Contract Coverage
DEC**

	Percent of Sample	
	1991	1990
<u>Days Covered</u>		
Monday - Friday	55	66
Monday - Saturday	3	6
Monday - Sunday	42	28
<u>Hours Covered</u>		
1 - 9	45	47
10 - 16	26	22
17 - 24	29	31



EXHIBIT III-B-2

Service Vendor Selection Criteria
DEC


SE: Standard Error of the Mean.



EXHIBIT III-B-3

**Hardware Maintenance Provider
DEC**

Provider	Percent of Mentions	Primary
Manufacturer	84	77
Dealer/Distributor	0	0
Independent Maintenance Organization	16	13
In-House	10	5
Other	10	5

Multiple Responses Allowed.



EXHIBIT III-B-4

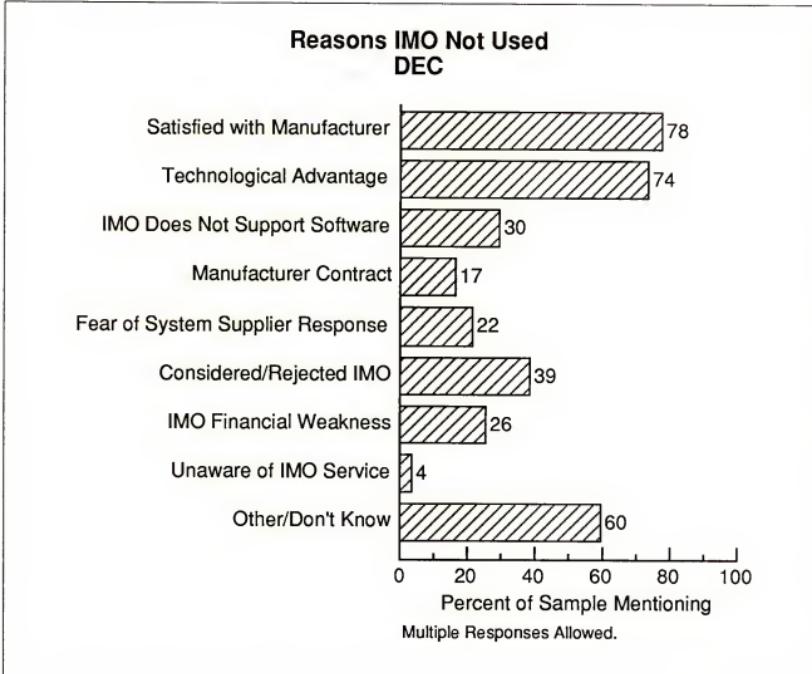




EXHIBIT III-B-5

**Maintenance Contract Terms
DEC**

Hardware Maintenance	Percent of Respondents
Warranty	7
Five Years	7
Three Years	13
One Year	70
Time and Materials	3
Other	0
None	0

EXHIBIT III-B-6

**System Availability Performance Analysis
DEC**

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	96.8	97.2	65
Response Time (hrs.)	4.2	2.2	90
Repair Time (hrs.)	5.0	2.8	71



EXHIBIT III-B-7

System Failure Rates DEC

Mean Failures Per Year	5.0
<u>Causes of Failure (%)</u>	
Hardware	48
Systems Software	11
Applications Software	4
Other	37

Sample: 29

EXHIBIT III-B-8

Hardware Service Required versus Received DEC

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	9.0	8.5	8.7	47
Engineer Skills	9.1	8.8	9.2	70
Documentation of Maintenance	7.5	8.1	8.7	79
Help Desk Support	7.8	7.9	8.7	82
Remote Diagnostics	7.8	8.0	9.0	83
Real-Time Software Diagnostics	8.3	7.9	7.9	68
Overall Hardware Maintenance	9.1	8.9	8.9	67

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT III-B-9

**Software Maintenance Provider
DEC**

Provider	Percent of Mentions
Hardware Manufacturer	90
Other Hardware Service Provider	0
Software Product Vendor	13
Value-Added Reseller (VAR)	0
In-House	33
Other	13

Multiple Responses Allowed.

EXHIBIT III-B-10

**System Software
Maintenance Contract Terms
DEC**

Software Maintenance	Percent of Respondents
Included in License Fee	26
Three-Year	7
One-Year	48
Custom	3
None	0
Don't Know	16



EXHIBIT III-B-11

**System Software Problem Resolution
DEC**

Solved by Phone (%)	81
Elapsed Time (hrs.)	9.8
<u>Other Problems</u>	
Response Time	
• Required (mean hrs.)	13.6
• Received (mean hrs.)	17.0
• Percent Satisfied	90
Fix Time	
• Required (mean hrs.)	13.8
• Received (mean hrs.)	6.6
• Percent Satisfied	89



EXHIBIT III-B-12

**System Software Support Required versus Received
DEC**

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	8.6	8.2	8.4	68
Documentation	8.7	8.2	8.1	50
Software Installation	7.7	7.8	8.5	75
Provision of Updates	8.4	8.3	8.2	73
Operational Training	5.7	6.1	7.9	78
Software Remote Support	8.6	8.3	8.3	79
Software Support Overall	8.7	8.2	8.3	59

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT III-B-13

Ancillary Services
DEC

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	19	6.7	6.4	50	1
Capacity Planning	18	6.7	6.5	67	1
Environmental Planning	13	6.3	7.0	77	2
Cabling	14	6.9	7.3	85	1
Software Evaluation	13	7.1	6.8	69	0
Maintenance-Related Training	11	5.7	4.9	60	1
Install/Deinstall/Move	24	7.3	7.4	78	0
Consulting	19	6.9	6.7	74	0
Network Planning	17	6.9	5.9	50	1
Network Management	13	6.1	5.3	67	1
Disaster Recovery	11	5.1	4.2	64	1
Facilities Management	9	4.3	4.2	89	0
Problem Management	14	6.1	6.3	71	2
Applications Software Support	22	7.0	6.3	41	0



EXHIBIT III-B-14

**Multivendor Services
DEC**

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	10	3.1
Peripherals	42	3.7
Network Products	29	3.5
<u>Level of Interest</u>		
Single Point of Contact	3.9	

Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT III-B-15

**Discounts
DEC**

	Percent Receiving	Mean Willingness to Receive
Multiyear	56	5.2
Prepayment	63	3.9
Call Screening/Problem Management	12	4.9
Deferred Response	8	2.9

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest



C**Hewlett-Packard 3000**

The sample consisted of 32 users of HP 3000 midrange system. In analyzing the data collected, the following points appear notable:

- As in other portions of the midrange systems sample, HP 3000 respondents value the service quality components more than contractual items when evaluating a service vendor.
- There appeared to be a shift in percent from respondents with their HP equipment still under warranty to one-year contracts—31% under warranty in 1990 to 3% in 1991. These users are now more approachable by the independents for service maintenance.
- Response time and repair time appear to be satisfactory, with 96% of the respondents receiving the time they require or less. System availability had a much lower percent of respondents receiving the level of service they require—69%.
- Overall, ratings for user satisfaction with aspects of hardware maintenance improved from the 1990 sample, with over 70% of the sample receiving the level of service they require or greater.
- Mean satisfaction ratings for the individual aspects of software support increased or stayed the same from the ratings for the same aspects examined in 1990. Operational training and software support overall had the lowest percent of users receiving support at or greater than their requirement—56% and 59%, respectively.
- There appears to be a demand for ancillary service by the HP 3000 respondents; over 50% of them had a requirement for ancillary services. Only facilities management fell below the 50% demand, with 30% of the respondents expressing a requirement for facilities management services, and 70% of those receiving the services receiving satisfactory levels of service.



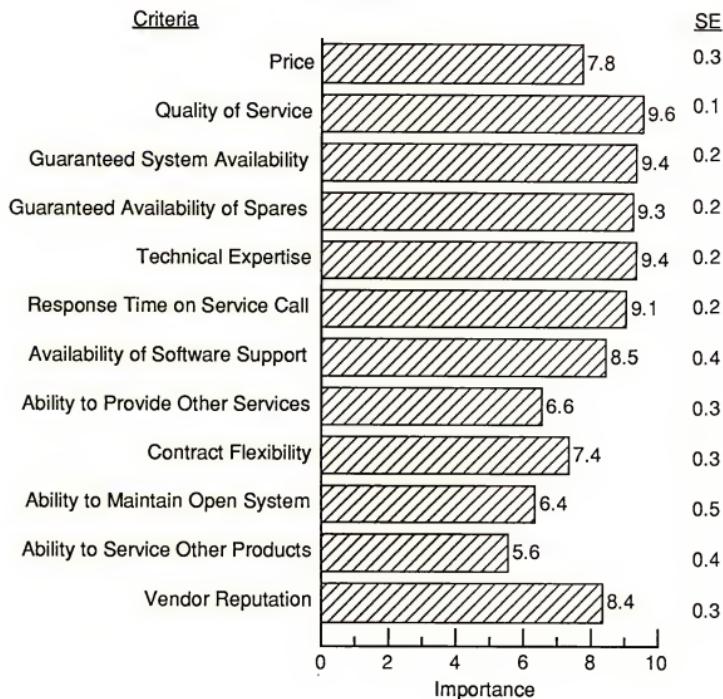
EXHIBIT III-C-1

**Contract Coverage
HP 3000**

	Percent of Sample	
	1991	1990
<u>Days Covered</u>		
Monday - Friday	37	59
Monday - Saturday	13	8
Monday - Sunday	50	33
<u>Hours Covered</u>		
1 - 9	22	42
10 - 16	25	25
17 - 24	53	33



EXHIBIT III-C-2

Service Vendor Selection Criteria
HP 3000


SE: Standard Error of the Mean.



EXHIBIT III-C-3

**Hardware Maintenance Provider
HP 3000**

Provider	Percent of Mentions	Primary
Manufacturer	94	94
Dealer/Distributor	0	0
Independent Maintenance Organization	6	6
In-House	0	0
Other	0	0

Multiple Responses Allowed.



EXHIBIT III-C-4

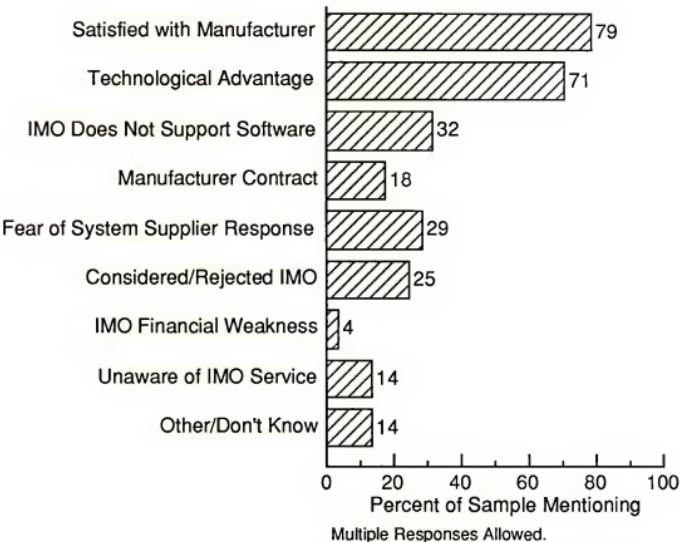
**Reasons IMO Not Used
HP 3000**



EXHIBIT III-C-5

**Maintenance Contract Terms
HP 3000**

Hardware Maintenance	Percent of Respondents
Warranty	3
Five Years	3
Three Years	3
One Year	72
Time and Materials	0
Other	19
None	0

EXHIBIT III-C-6

**System Availability Performance Analysis
HP 3000**

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	97.8	97.2	69
Response Time (hrs.)	5.5	3.6	96
Repair Time (hrs.)	5.4	3.7	96



EXHIBIT III-C-7

System Failure Rates HP 3000

Mean Failures Per Year	2.4
<u>Causes of Failure (%)</u>	
Hardware	50
Systems Software	25
Applications Software	5
Other	20

Sample: 32

EXHIBIT III-C-8

Hardware Service Required versus Received HP 3000

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	9.0	9.1	9.2	81
Engineer Skills	8.9	9.0	9.0	84
Documentation of Maintenance	7.6	8.1	8.5	81
Help Desk Support	8.3	8.5	8.8	83
Remote Diagnostics	7.8	8.5	8.6	94
Real-Time Software Diagnostics	7.7	7.8	8.2	72
Overall Hardware Maintenance	9.2	9.1	9.3	75

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT III-C-9

**Software Maintenance Provider
HP 3000**

Provider	Percent of Mentions
Hardware Manufacturer	88
Other Hardware Service Provider	0
Software Product Vendor	16
Value-Added Reseller (VAR)	0
In-House	25
Other	13

Multiple Responses Allowed.

EXHIBIT III-C-10

**System Software
Maintenance Contract Terms
HP 3000**

Software Maintenance	Percent of Respondents
Included in License Fee	13
Three-Year	0
One-Year	66
Custom	12
None	3
Don't Know	6



EXHIBIT III-C-11

**System Software Problem Resolution
HP 3000**

Solved by Phone (%)	94
Elapsed Time (hrs.)	2.8
<u>Other Problems</u>	
Response Time	
• Required (mean hrs.)	9.9
• Received (mean hrs.)	9.0
• Percent Satisfied	100
Fix Time	
• Required (mean hrs.)	4.5
• Received (mean hrs.)	5.3
• Percent Satisfied	85



EXHIBIT III-C-12

**System Software Support Required versus Received
HP 3000**

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	9.1	8.3	8.4	67
Documentation	8.4	7.5	7.8	47
Software Installation	8.6	8.3	8.1	69
Provision of Updates	8.2	8.5	8.3	77
Operational Training	7.3	7.3	8.0	56
Software Remote Support	8.2	8.5	8.9	83
Software Support Overall	8.8	8.4	8.3	59

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT III-C-13

Ancillary Services
HP 3000

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	26	6.4	7.0	84	3
Capacity Planning	22	7.3	6.5	50	4
Environmental Planning	18	6.0	6.6	94	5
Cabling	16	5.6	6.3	94	3
Software Evaluation	15	6.3	6.3	73	7
Maintenance-Related Training	18	5.3	5.9	82	4
Install/Deinstall/Move	24	7.4	8.3	92	2
Consulting	23	6.7	6.7	70	3
Network Planning	18	6.9	6.4	61	4
Network Management	17	6.7	6.2	53	4
Disaster Recovery	19	7.9	6.0	50	4
Facilities Management	10	5.4	4.7	70	3
Problem Management	15	7.2	6.6	53	2
Applications Software Support	16	7.2	7.0	50	3



EXHIBIT III-C-14

**Multivendor Services
HP 3000**

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	6	2.0
Peripherals	9	2.3
Network Products	13	2.9
<u>Level of Interest</u>		
Single Point of Contact	3.9	

Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT III-C-15

**Discounts
HP 3000**

	Percent Receiving	Mean Willingness to Receive
Multiyear	17	4.7
Prepayment	24	4.4
Call Screening/Problem Management	7	4.1
Deferred Response	24	3.5

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest



D IBM 937X

The sample consisted of 31 users of IBM 937X midrange systems. The following points are noteworthy in the 937X user group data analysis:

- Three percent of the 937X group reported using independent maintenance as their primary service, with all of the users responding that they use the manufacturer for all or part of their service plan.
- There was no overwhelming reason why the respondents did not use an IMO as part of their plan.
- Mean system availability for the 937X group exceeded the mean requirement, yet only 64% of the group received system availability that met or exceeded their requirements. Response time and repair time had higher percentages (96% and 87%) of users receiving satisfactory service in these areas.



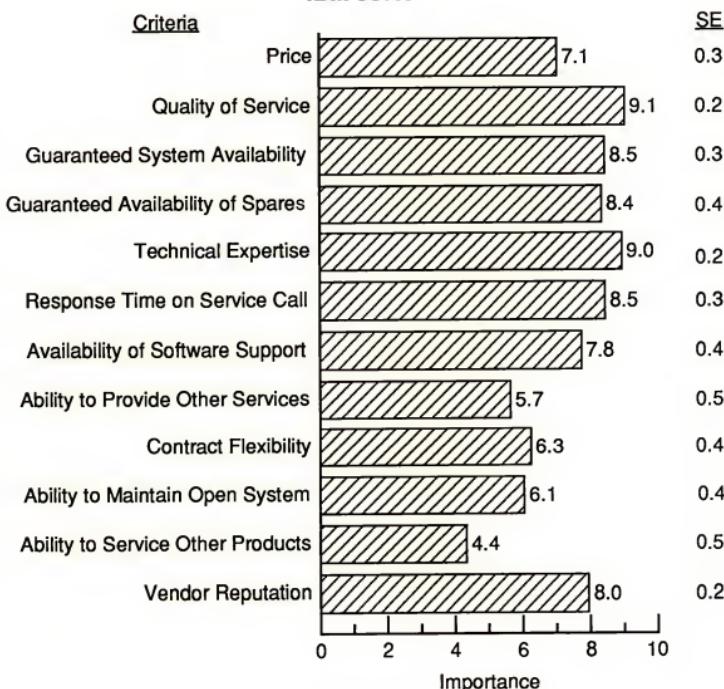
EXHIBIT III-D-1

**Contract Coverage
IBM 937X**

	Percent of Sample 1991
<u>Days Covered</u>	
Monday - Friday	10
Monday - Saturday	0
Monday - Sunday	90
<u>Hours Covered</u>	
1 - 9	10
10 - 16	0
17 - 24	90



EXHIBIT III-D-2

**Service Vendor Selection Criteria
IBM 937X**


SE: Standard Error of the Mean.

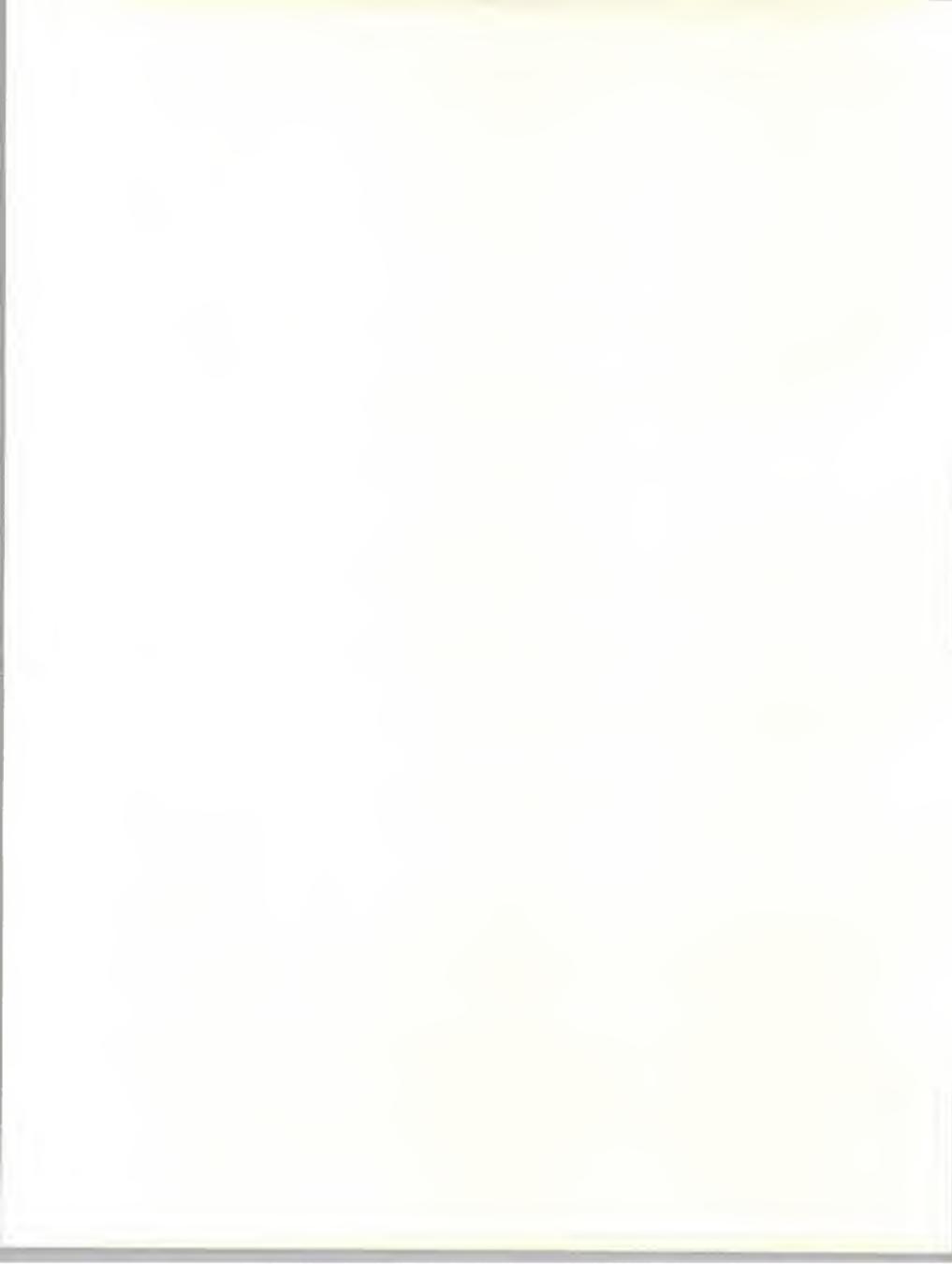


EXHIBIT III-D-3

**Hardware Maintenance Provider
IBM 937X**

Provider	Percent of Mentions	Primary
Manufacturer	100	97
Dealer/Distributor	3	0
Independent Maintenance Organization	3	3
In-House	0	0
Other	0	0

Multiple Responses Allowed.



EXHIBIT III-D-4

Reasons IMO Not Used
IBM 937X

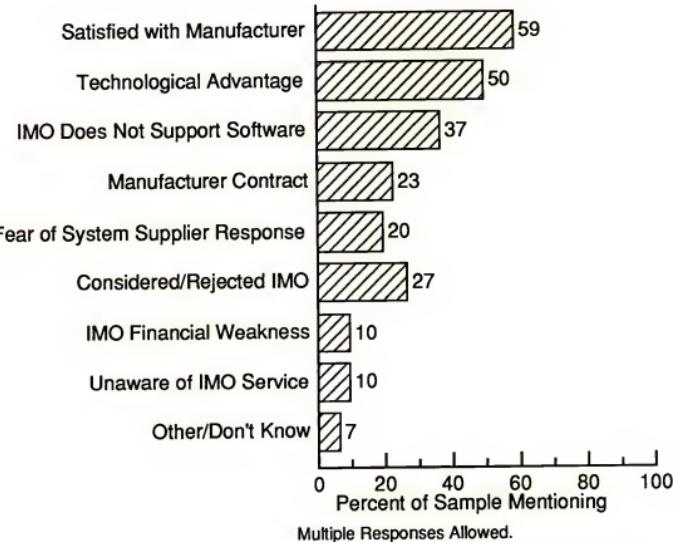




EXHIBIT III-D-5

**Maintenance Contract Terms
IBM 937X**

Hardware Maintenance	Percent of Respondents
Warranty	3
Five Years	10
Three Years	7
One Year	57
Time and Materials	6
Other	17
None	0

EXHIBIT III-D-6

**System Availability Performance Analysis
IBM 937X**

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	94.8	95.4	64
Response Time (hrs.)	2.7	2.4	96
Repair Time (hrs.)	2.6	2.4	87



EXHIBIT III-D-7

System Failure Rates IBM 937X

Mean Failures Per Year	3.1
<u>Causes of Failure (%)</u>	
Hardware	54
Systems Software	14
Applications Software	3
Other	29

Sample: 30

EXHIBIT III-D-8

Hardware Service Required versus Received IBM 937X

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	7.9	7.9	8.2	74
Engineer Skills	8.6	8.4	8.6	74
Documentation of Maintenance	6.2	6.5	7.3	84
Help Desk Support	6.7	6.4	7.0	67
Remote Diagnostics	5.6	5.3	6.0	82
Real-Time Software Diagnostics	5.0	4.7	5.3	86
Overall Hardware Maintenance	3.9	8.8	9.0	81

Note: Scale 1-10, 1 = Lowest, 10 = Highest

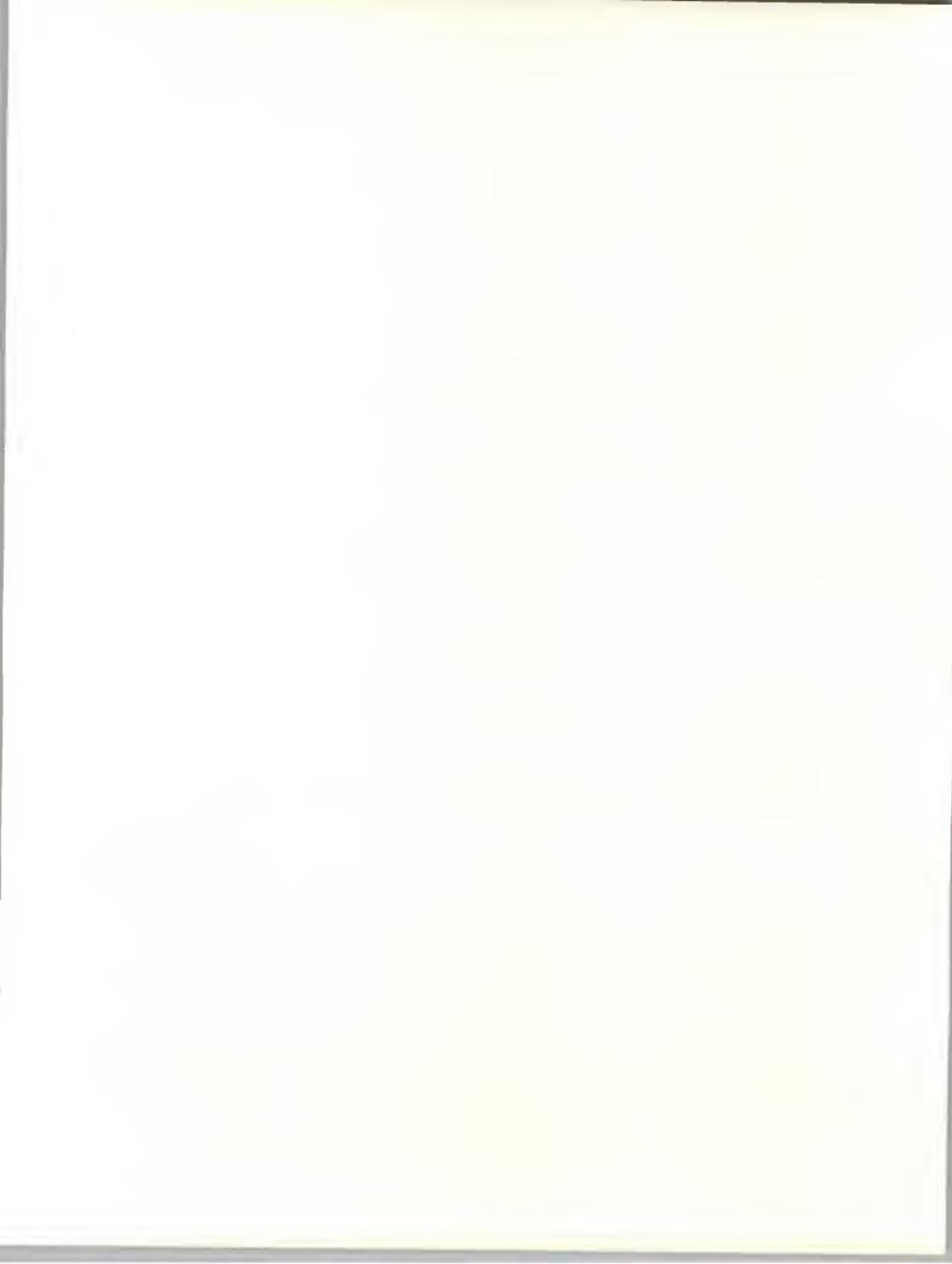


EXHIBIT III-D-9

**Software Maintenance Provider
IBM 937X**

Provider	Percent of Mentions
Hardware Manufacturer	81
Other Hardware Service Provider	3
Software Product Vendor	3
Value-Added Reseller (VAR)	0
In-House	45
Other	0

Multiple Responses Allowed.

EXHIBIT III-D-10

**System Software
Maintenance Contract Terms
IBM 937X**

Software Maintenance	Percent of Respondents
Included in License Fee	36
Three-Year	3
One-Year	19
Custom	19
None	10
Don't Know	13



EXHIBIT III-D-11

**System Software Problem Resolution
IBM 937X**

Solved by Phone (%)	76
Elapsed Time (hrs.)	9.4
<u>Other Problems</u>	
Response Time	
• Required (mean hrs.)	10.9
• Received (mean hrs.)	10.0
• Percent Satisfied	93
Fix Time	
• Required (mean hrs.)	7.4
• Received (mean hrs.)	8.0
• Percent Satisfied	86



EXHIBIT III-D-12

**System Software Support Required versus Received
IBM 937X**

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	8.8	7.8	7.8	57
Documentation	8.4	7.2	7.5	45
Software Installation	8.2	6.8	7.6	58
Provision of Updates	7.5	6.9	7.3	68
Operational Training	6.2	5.0	6.0	68
Software Remote Support	5.5	5.4	5.7	70
Software Support Overall	8.5	7.7	7.8	58

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT III-D-13

Ancillary Services
IBM 937X

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	21	7.0	7.0	76	2
Capacity Planning	19	6.7	6.6	63	5
Environmental Planning	16	5.3	5.9	81	6
Cabling	19	6.6	6.6	63	3
Software Evaluation	15	6.2	4.9	60	2
Maintenance-Related Training	14	5.3	4.9	64	5
Install/Deinstall/Move	26	6.8	7.2	85	2
Consulting	17	6.8	6.8	71	1
Network Planning	18	5.9	6.1	61	5
Network Management	15	5.7	6.0	60	5
Disaster Recovery	11	5.9	5.5	55	6
Facilities Management	9	4.7	4.9	75	4
Problem Management	13	4.9	4.8	77	5
Applications Software Support	13	5.3	5.2	69	4



EXHIBIT III-D-14

Multivendor Services
IBM 937X

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	7	2.5
Peripherals	13	2.6
Network Products	10	2.7
<u>Level of Interest</u>		
Single Point of Contact	3.1	

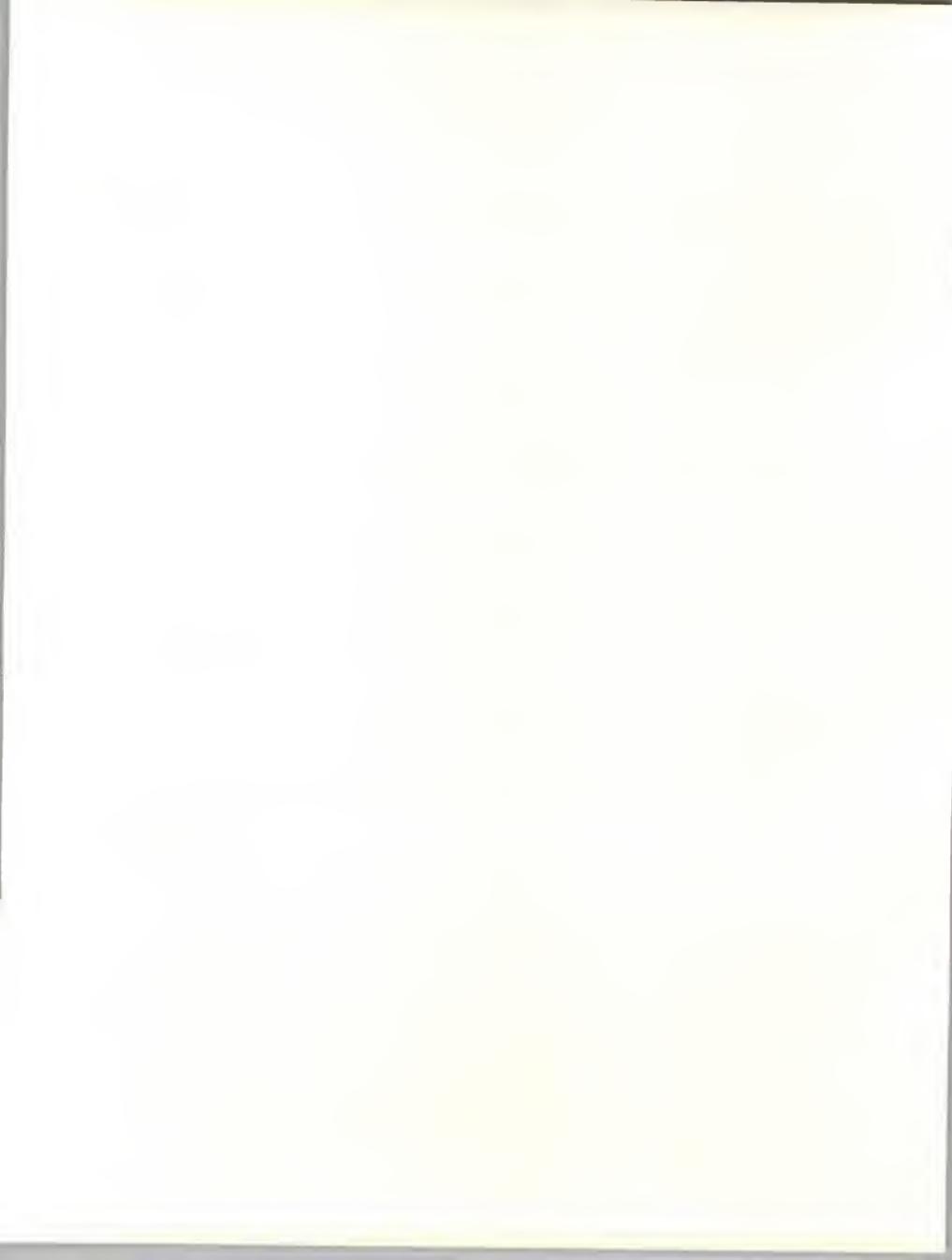
Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT III-D-15

Discounts
IBM 937X

	Percent Receiving	Mean Willingness to Receive
Multiyear	40	5.8
Prepayment	20	5.4
Call Screening/Problem Management	12	4.9
Deferred Response	4	4.6

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest



E
IBM AS/400

The user group consisted of 30 users of the AS/400 system. The following items appeared to be noteworthy in comparing the 1991 AS/400 user group with the 1991 user sample as a whole:

- A high percent of the AS/400 users reported having a five-year contract with the manufacturer as opposed to the sample as a whole—38% versus 14%.
- The AS/400 user group reported a lower number of system failures per year than the midrange group as a whole, with a higher percent attributed to hardware problems.
- Compared to the whole midrange group and other vendor/product groups, the AS/400 group seems to have a lower requirement for service ancillary to the maintenance function. Less than 50% of the respondents reported either contracting for ancillary services or requiring service they are not receiving.
- A fairly high percent of the respondents did report receiving discounts for signing multiyear contracts and contracts with prepayment clauses.

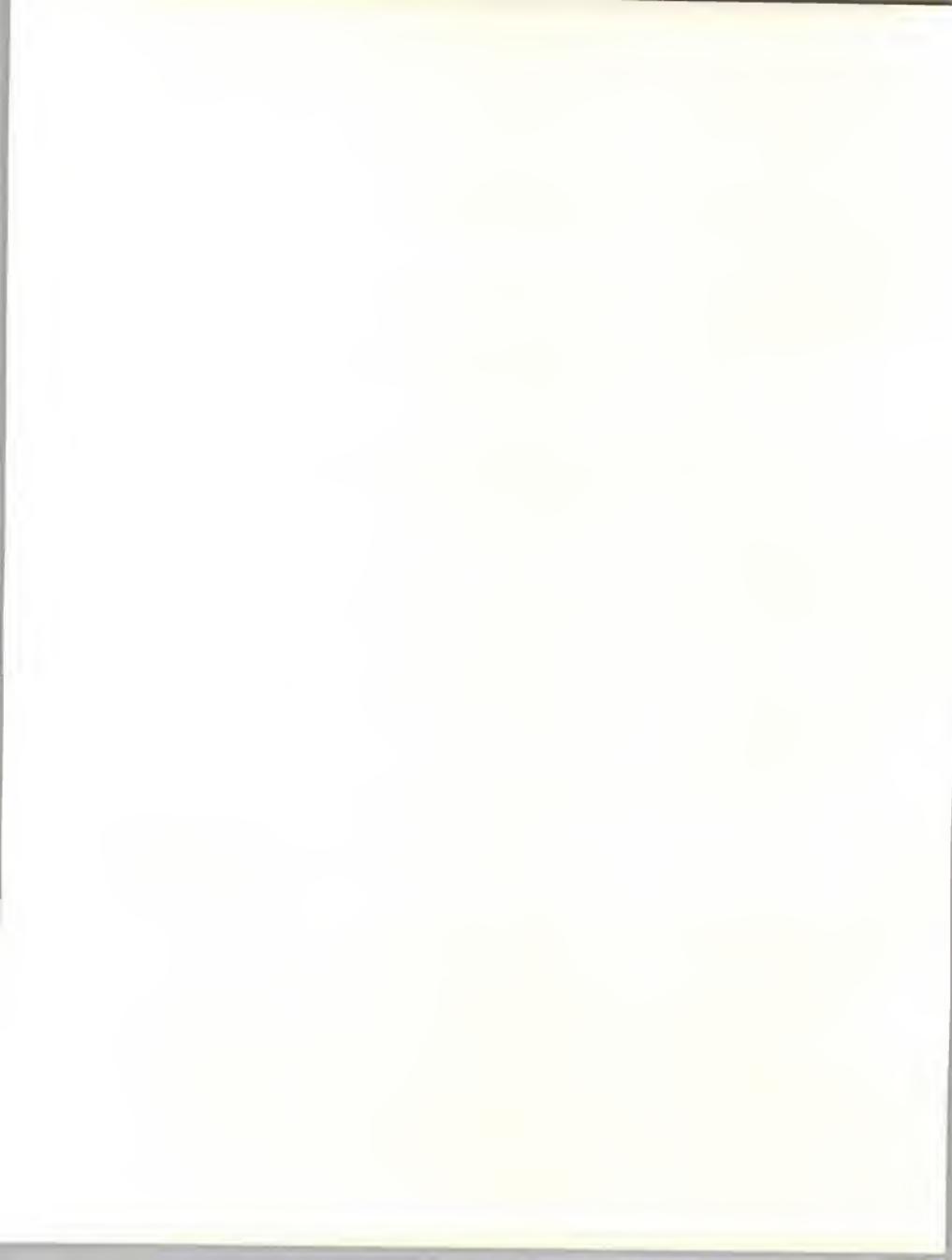


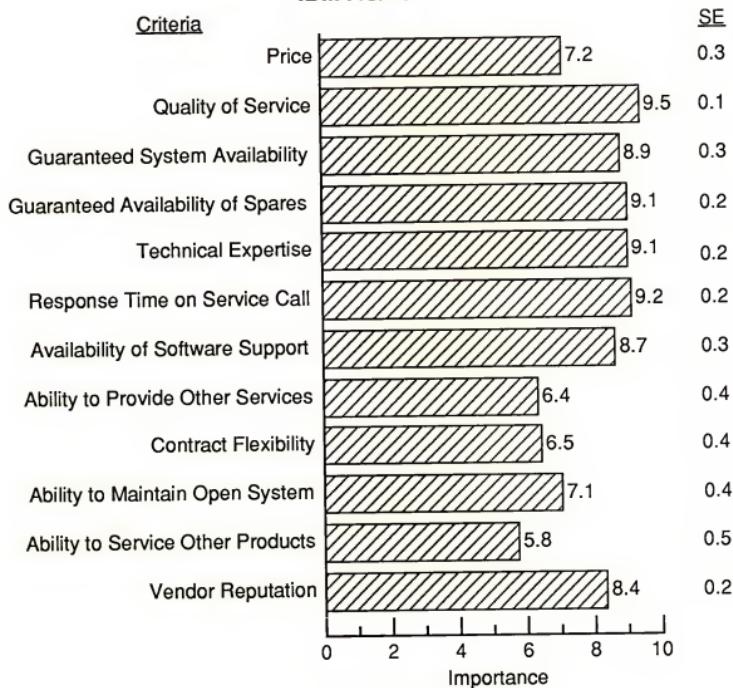
EXHIBIT III-E-1

**Contract Coverage
IBM AS/400**

	Percent of Sample 1991
<u>Days Covered</u>	
Monday - Friday	17
Monday - Saturday	0
Monday - Sunday	83
<u>Hours Covered</u>	
1 - 9	17
10 - 16	0
17 - 24	83



EXHIBIT III-E-2

**Service Vendor Selection Criteria
IBM AS/400**


SE: Standard Error of the Mean.

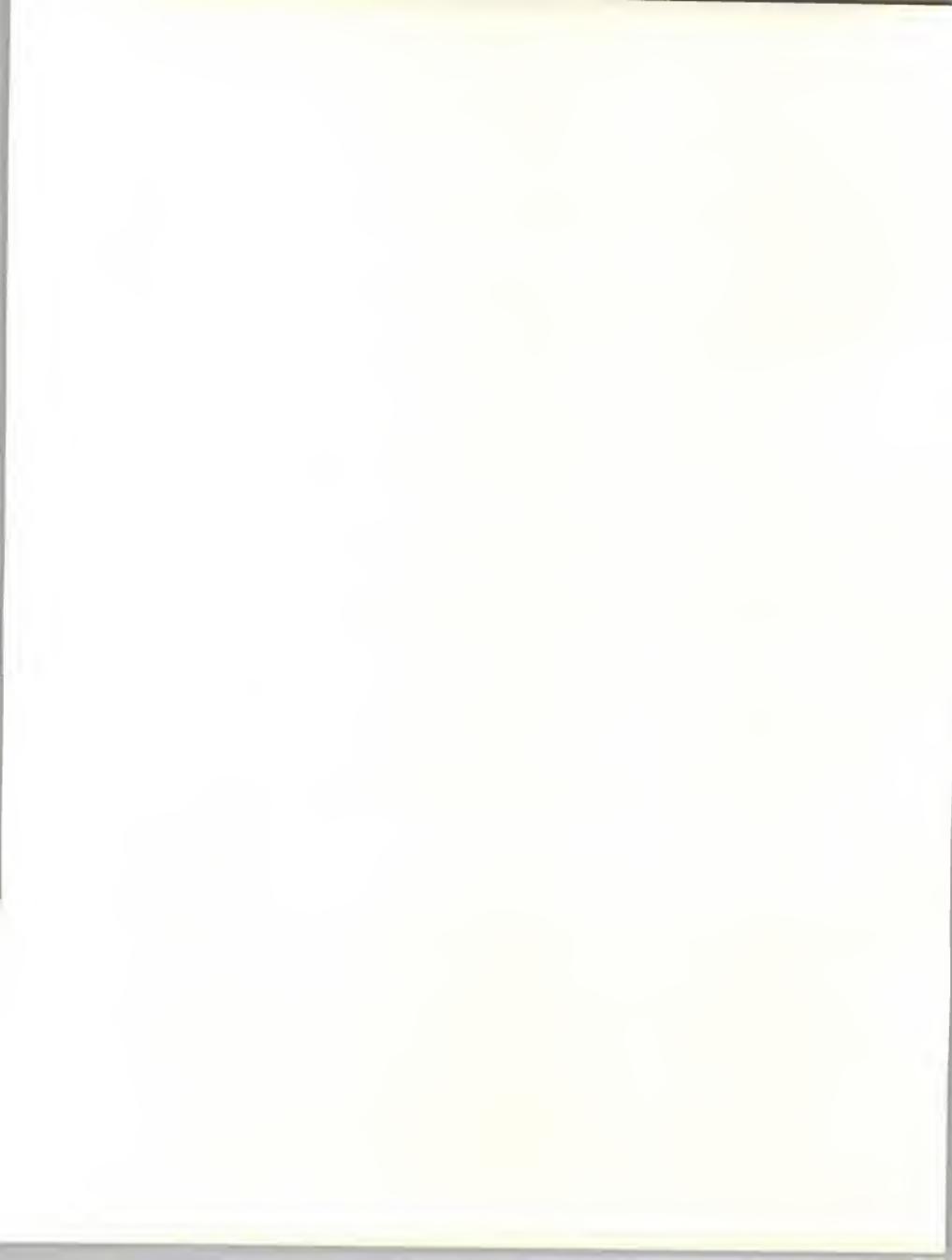


EXHIBIT III-E-3

**Hardware Maintenance Provider
IBM AS/400**

Provider	Percent of Mentions	Primary
Manufacturer	93	93
Dealer/Distributor	0	0
Independent Maintenance Organization	7	7
In-House	0	0
Other	0	0

Multiple Responses Allowed.



EXHIBIT III-E-4

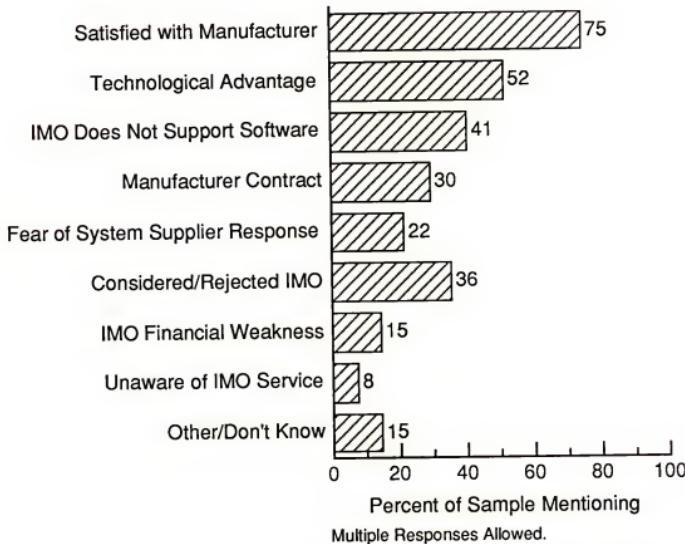
**Reasons IMO Not Used
IBM AS/400**



EXHIBIT III-E-5

**Maintenance Contract Terms
IBM AS/400**

Hardware Maintenance	Percent of Respondents
Warranty	3
Five Years	38
Three Years	10
One Year	42
Time and Materials	0
Other	7
None	0

EXHIBIT III-E-6

**System Availability Performance Analysis
IBM AS/400**

	Mean Required	Mean Received	Percent Satisfied
System Availability (%)	95.8	95.7	72
Response Time (hrs.)	3.0	2.8	84
Repair Time (hrs.)	3.6	3.8	77



EXHIBIT III-E-7

System Failure Rates IBM AS/400

Mean Failures Per Year	1.9
<u>Causes of Failure (%)</u>	
Hardware	74
Systems Software	13
Applications Software	2
Other	11

EXHIBIT III-E-8

Hardware Service Required versus Received IBM AS/400

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Spares Availability	8.7	8.6	9.0	75
Engineer Skills	9.5	8.8	8.8	55
Documentation of Maintenance	7.2	7.7	8.3	82
Help Desk Support	8.4	7.9	8.3	79
Remote Diagnostics	7.7	7.9	8.7	84
Real-Time Software Diagnostics	8.8	8.3	8.2	63
Overall Hardware Maintenance	9.2	8.8	8.8	66

Note: Scale 1-10, 1 = Lowest, 10 = Highest



EXHIBIT III-E-9

Software Maintenance Provider
IBM AS/400

Provider	Percent of Mentions
Hardware Manufacturer	83
Other Hardware Service Provider	3
Software Product Vendor	7
Value-Added Reseller (VAR)	13
In-House	27
Other	3

Multiple Responses Allowed.

EXHIBIT III-E-10

**System Software
Maintenance Contract Terms**
IBM AS/400

Software Maintenance	Percent of Respondents
Included in License Fee	43
Three-Year	0
One-Year	13
Custom	14
None	3
Don't Know	27



EXHIBIT III-E-11

**System Software Problem Resolution
IBM AS/400**

Solved by Phone (%)	77
Elapsed Time (hrs.)	7.0
<u>Other Problems</u>	
Response Time	
• Required (mean hrs.)	11.3
• Received (mean hrs.)	10.6
• Percent Satisfied	71
Fix Time	
• Required (mean hrs.)	9.4
• Received (mean hrs.)	8.5
• Percent Satisfied	91



EXHIBIT III-E-12

**System Software Support Required versus Received
IBM AS/400**

	Mean Required	Mean Received	Mean Satisfaction	Percent Satisfied
Engineer Skills	9.0	7.8	7.9	54
Documentation	8.6	8.0	8.4	68
Software Installation	8.7	7.3	7.9	54
Provision of Updates	9.0	8.3	8.6	64
Operational Training	7.7	6.8	7.0	70
Software Remote Support	8.6	7.9	8.2	70
Software Support Overall	8.9	7.9	7.9	50

Note: Scale 1-10, 1 = Lowest, 10 = Highest

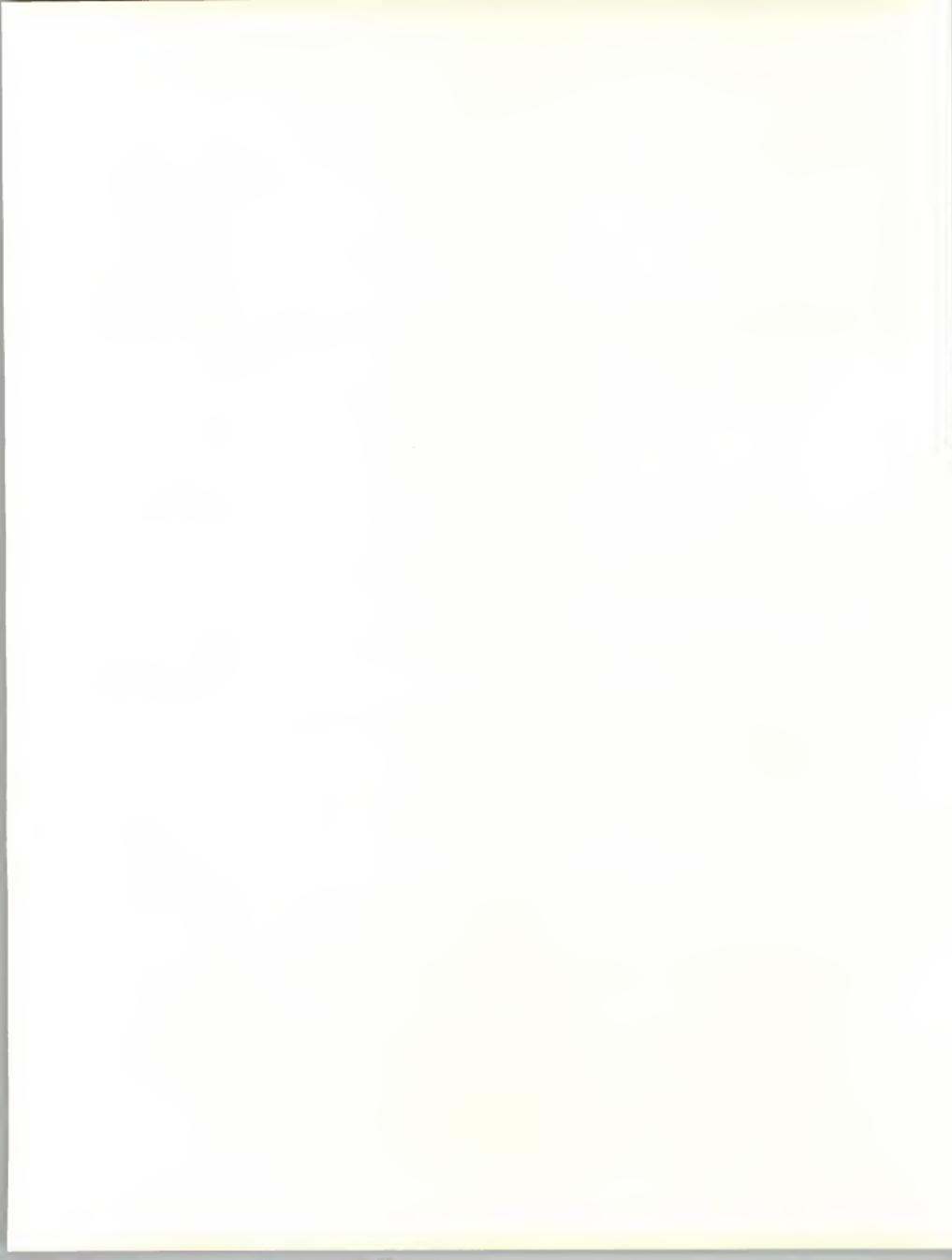


EXHIBIT III-E-13

**Ancillary Services
IBM AS/400**

	Number of Mentions Currently Contracted	Mean Level Required	Mean Level Received	Percent Satisfied	Number of Mentions Not Receiving But Required
Configuration Planning	5	7.3	8.3	92	9
Capacity Planning	1	6.9	6.9	69	7
Environmental Planning	1	6.4	6.6	86	2
Cabling	5	6.9	8.0	100	4
Software Evaluation	3	6.4	6.7	53	7
Maintenance-Related Training	3	6.7	6.8	75	5
Install/Deinstall/Move	2	7.6	7.8	61	4
Consulting	5	7.4	7.8	79	4
Network Planning	3	7.3	7.6	71	5
Network Management	3	6.8	7.5	75	4
Disaster Recovery	3	7.3	7.0	65	6
Facilities Management	1	6.2	7.3	100	10
Problem Management	2	7.6	7.1	63	2
Applications Software Support	1	7.1	7.6	79	6



EXHIBIT III-E-14

Multivendor Services
IBM AS/400

Service on Other Manufacturers'	Percent Receiving	Interest in Three Years
CPUs	10	1.9
Peripherals	27	2.4
Network Products	7	2.5
<u>Level of Interest</u>		
Single Point of Contact	3.3	

Note: Scale 1 - 5, 1 = Lowest, 5 = Highest

EXHIBIT III-E-15

Discounts
IBM AS/400

	Percent Receiving	Mean Willingness to Receive
Multiyear	69	7.3
Prepayment	48	5.0
Call Screening/Problem Management	17	5.0
Deferred Response	12	4.6

Note: Scale 1 - 10, 1 = Lowest, 10 = Highest



IV

Summary Charts



IV

Summary Charts

In this chapter, INPUT presents a summary of selected data from the 1991 midrange systems user requirements study. These summary charts allow a vendor-by-vendor comparison of service performance. Data is presented on factors that can be compared on an absolute basis.

The key to customer satisfaction is the ability of the vendor to meet or exceed the expectations of the customer. Even the highest rating is insufficient if the user's requirement exceeds the rating.

In these charts, the following definitions apply:

- Difference is a comparison of the mean service required with the mean service received. A negative number denotes a shortfall in the service received. A positive number denotes the mean service received exceeding the mean service required.
- Percent satisfied is based on whether the service received met or exceeded service required for each individual respondent. A count is made of how many individuals had their requirements met or exceeded for that particular service requirement; this converts to the percent satisfied.



EXHIBIT IV-1

Midrange Systems Vendor Performance
System Interruptions

Vendor	Mean Number Per Year	Percent Caused By:			
		Hardware	System Software	Applications Software	Other
Data General	5.6	65	10	0	25
DEC	5.0	48	11	4	37
HP 3000	2.4	50	25	5	20
IBM 937X	3.1	54	14	3	29
IBM AS/400	1.9	74	13	2	11
All Vendors	3.3	58	14	3	25

EXHIBIT IV-2

Midrange Systems Vendor Performance
System Availability

Vendor	System Availability (Percent)		
	Required	Received	Difference
Data General	97.3	94.4	-2.9
DEC	96.8	97.2	0.4
HP 3000	97.8	97.2	-0.6
IBM 937X	94.8	95.4	0.6
IBM AS/400	95.8	95.7	-0.1
All Vendors	96.5	96.0	-0.5



EXHIBIT IV-3

Midrange Systems Vendor Performance Response Time

Vendor	Response Time (Hours)		
	Required	Received	Difference
Data General	6.6	6.4	0.2
DEC	4.2	2.2	2.0
HP 3000	5.5	3.6	1.9
IBM 937X	2.7	2.4	0.3
IBM AS/400	3.0	2.8	0.2
All Vendors	4.4	3.4	1.0

EXHIBIT IV-4

Midrange Systems Vendor Performance Repair Time

Vendor	Repair Time (Hours)		
	Required	Received	Difference
Data General	4.9	4.5	0.4
DEC	5.0	2.8	2.2
HP 3000	5.4	3.7	1.7
IBM 937X	2.6	2.4	0.2
IBM AS/400	3.6	3.8	-0.2
All Vendors	4.3	3.5	0.8



EXHIBIT IV-5

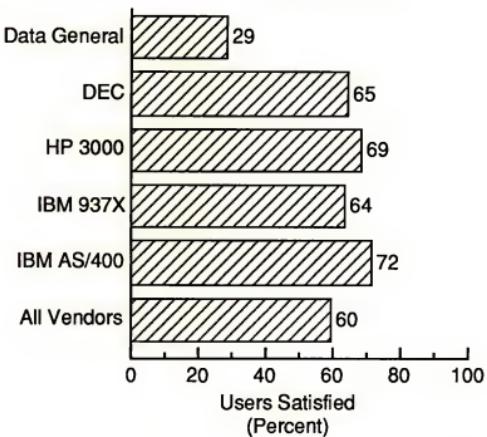
**Midrange Systems Vendor Performance
System Availability Satisfaction**



EXHIBIT IV-6

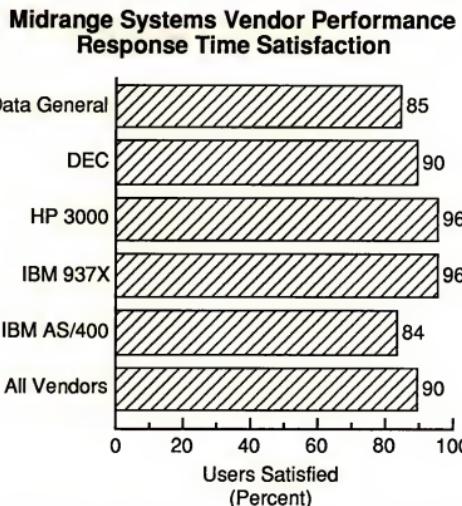




EXHIBIT IV-7

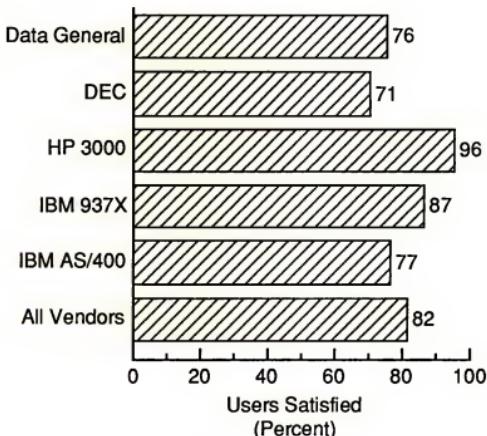
**Midrange Systems Vendor Performance
Repair Time Satisfaction**



EXHIBIT IV-8

Midrange Systems Vendor Performance
Hardware Maintenance
Required versus Received

Vendor	Mean Required	Mean Received	Mean Satisfaction
Data General	9.5	8.4	8.5
DEC	9.1	8.9	8.9
HP 3000	9.2	9.1	9.3
IBM 937X	8.9	8.8	9.0
IBM AS/400	9.2	8.8	8.8
All Vendors	9.2	8.8	8.9



EXHIBIT IV-9

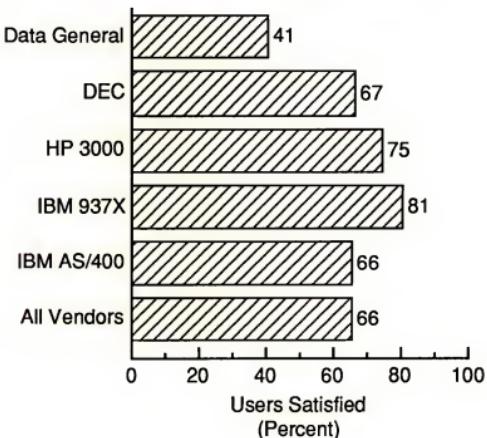
**Midrange Systems Vendor Performance
Hardware Maintenance Satisfaction**



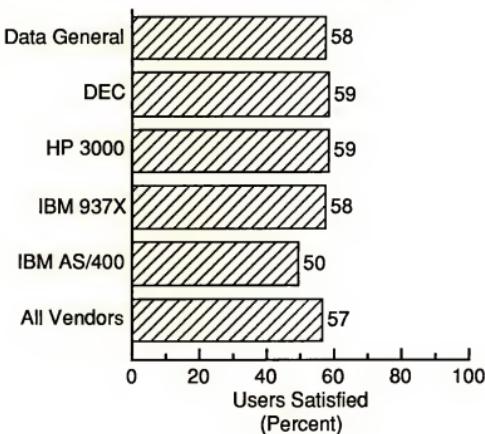
EXHIBIT IV-10

**Midrange Systems Vendor Performance
Software Support
Required versus Received**

Vendor	Mean Required	Mean Received	Mean Satisfaction
Data General	8.9	8.3	8.3
DEC	8.7	8.2	8.3
HP 3000	8.8	8.4	8.3
IBM 937X	8.5	7.7	7.8
IBM AS/400	8.9	7.9	7.9
All Vendors	8.8	8.1	8.1



EXHIBIT IV-11

**Midrange Systems Vendor Performance
Software Support Satisfaction**



Appendix





Appendix: Questionnaire

A. GENERAL

1. What is the make and model of the main computer on your site and how many units do you have?

- Make _____
- Model _____
- Units _____

2. Are you the person responsible for this system?

If not, then who would be the correct person?

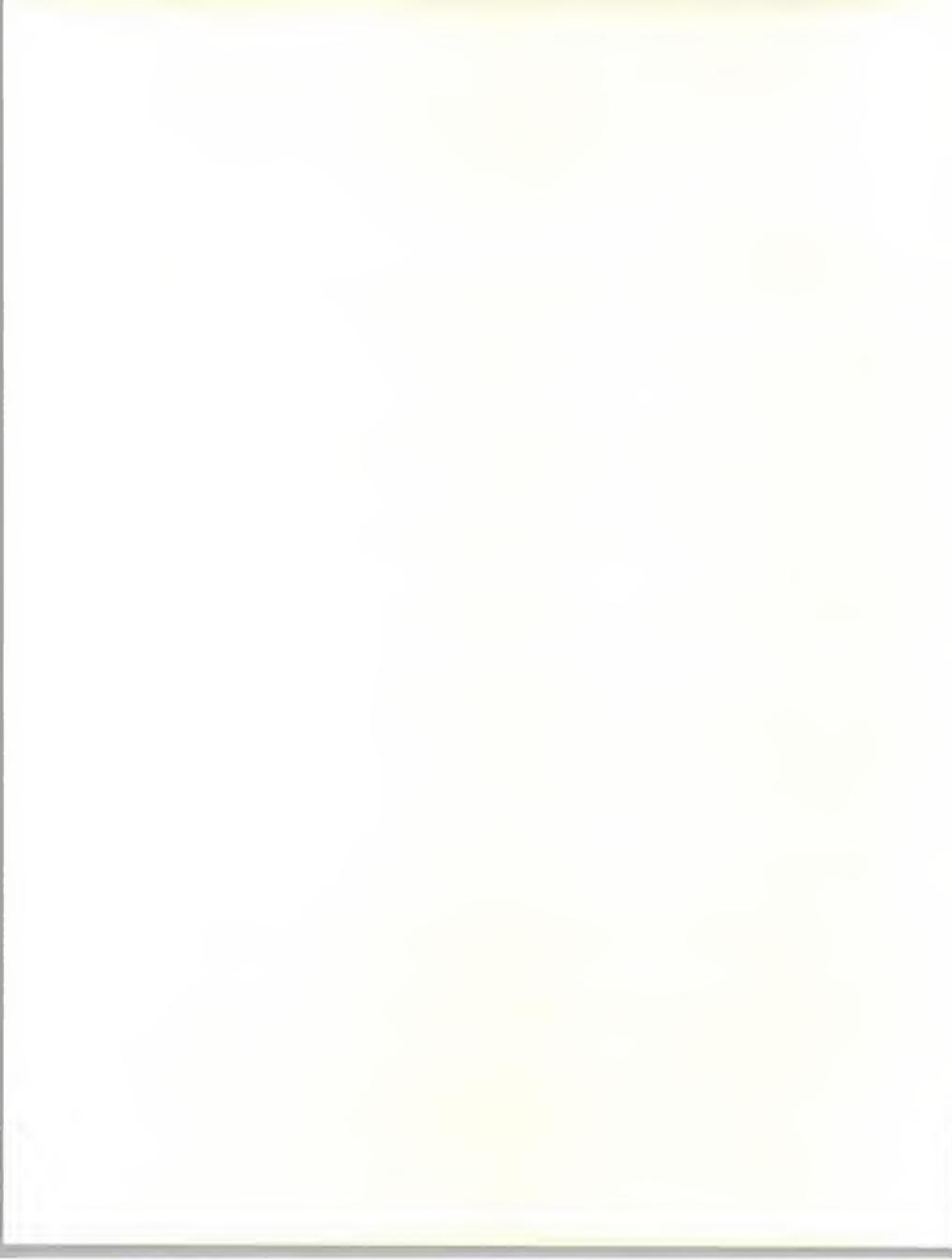
Name of person responsible _____

Phone Number _____

3. Do you have another system? What is the make and model number of that system, and how many units do you have?

- Make _____
- Model _____
- Units _____

All of the following questions that I am going to ask you are related to your
_____ system.



4. Could you please rate the importance of the following criteria in selecting your service vendor, on a scale of 1 to 10 (1=Low, 10=High)?

<u>Criteria</u>	<u>Rating</u>
a) Price	_____
b) Quality of service	_____
c) Guaranteed system availability level	_____
d) Guaranteed availability of spare parts	_____
e) Technical expertise	_____
f) Response time on a service call	_____
g) Availability of software support	_____
h) Ability to provide other services	_____
i) Contract flexibility	_____
j) Ability to maintain open system	_____
k) Ability to service other products	_____
l) Vendor reputation	_____

B. SERVICE VENDOR SELECTION

I would like to ask you some questions about the basic hardware maintenance of your computer system.

5. Would you please tell me who services your system hardware?
Who is the primary service vendor? (check one)

(Please circle appropriate service provider type; multiple answers are allowed.)

Primary

- Manufacturer Y/N _____
- Dealer/distributor Y/N _____
- Independent maintenance company Y/N _____
- Own company Y/N _____
- Other _____ Y/N _____



If the respondent answered YES to independent maintenance, continue with question 6A. If not, go to question 6B.

6A. Your system, or part of it, is serviced by an independent maintenance company. Could you tell me the reason why you use independent maintenance?

(Please circle appropriate answer; multiple answers are allowed.)

- Lower cost Y/N
- Local service Y/N
- Single-source service Y/N
- Better able to maintain open system Y/N
- TPM service higher quality Y/N
- More flexible contract Y/N
- Other Y/N
- Do not know Y/N

(Go to question 7)

6B. You do not use an independent maintenance company. What is the reason for this?

(Please circle appropriate answer; multiple answers are allowed.)

- Satisfied with manufacturer Y/N
- Manufacturer has a technological advantage Y/N
- IMO cannot support software Y/N
- Tied to manufacturer with long-term contract Y/N
- Fear of system supplier response Y/N
- Considered and rejected IMO Y/N
- IMO financial weakness Y/N
- Unaware of IMO service Y/N
- Other Y/N
- Do not know Y/N



7. What maintenance coverage do you receive on this CPU:

- How many days per week? _____
- How many hours per day? _____
- Which type of hardware maintenance contract do you currently have on the main part of your system?

(Please circle appropriate answer; only ONE answer allowed.)

- Warranty 1
- Five years 2
- Three years 3
- One year 4
- Time and Materials 5
- Other _____ 6
- None 7

8. Over the last 12 months, how many system interruptions (system failures) did you have per month? _____ or per year? _____

And, what percentage of these system failures were due to:

Hardware _____ %

Systems software _____ %

Applications software _____ %

Other (i.e., power failure) _____ %

(Please check that percentages add up to 100%)

9. If we defined SYSTEMS AVAILABILITY as the percentage of your normal working hours that the system is operational (disregarding non-critical peripheral outages), what percentage availability do you require? What is the percentage actually received over the last twelve months for that system?

- Required _____ %
- Received _____ %



10. Defining HARDWARE RESPONSE TIME as the time it takes between reporting a fault and the arrival of the service engineer on site, in working hours, what response time (in hours) do you require, and what did you actually experience as an average over the last twelve months?

- Require _____ Hours
- Experienced _____ Hours

11. If REPAIR TIME is defined as the time taken to get the system fully operational from the time the engineer arrives on site, what time do you require (in working hours) and what time did you experience during the last twelve months?

- Require _____ Hours
- Experienced _____ Hours

12. I would now like to go through a list of seven aspects of hardware maintenance and ask you to give each a rating on a scale of 1-10 for the service level you require, the service level you receive, and your satisfaction with that service.

	<u>Required</u>	<u>Received</u>	<u>Satisfaction</u>
• Spares Availability	_____	_____	_____
• Engineer Skills	_____	_____	_____
• Documentation of Maintenance	_____	_____	_____
• Help Desk Support	_____	_____	_____
• Remote Diagnostics	_____	_____	_____
• Real-time Software Diagnostics	_____	_____	_____
• Overall Hardware Maintenance	_____	_____	_____

13. If possible, I would like you to provide some information on hardware maintenance pricing.

a) What percentage price increase or decrease did you pay for hardware maintenance in the year 1990?

- Increase _____ %
- Decrease _____ %
- No Change Y/N (Circle)

b) What do you expect the price changes for hardware maintenance to be in the future, in percentage terms per year?

- Increase _____ %
- Decrease _____ %
- No Change Y/N (Circle)

C. SOFTWARE SUPPORT

I would like to ask you some questions now regarding the software service that you receive. These questions relate to system software only - NOT APPLICATIONS SOFTWARE.

14A. Who supports your systems software?

(Please circle appropriate answer; multiple answers allowed.)

- Hardware Manufacturer Y/N
- Other Hardware Service Provider Y/N
(Specify _____)
- Software Product Vendor Y/N
- Value-Added Reseller (VAR) Y/N
- In-house Y/N
- Other (Specify _____) Y/N
- Do not know Y/N



14B. What type of systems software support contract do you currently have?

(Please circle appropriate answer. Only ONE answer allowed.)

- Support included in software license fee 1
- Three-year contract 2
- One-year contract 3
- Ad hoc/custom 4
- None 5
- Do not know 9

15. What percentage of systems software problems are solved by telephone, and on average, how long does this take in elapsed time?

- Solved by Phone _____ %
- Elapsed Time _____ Hours

16. For those problems that are NOT possible to solve over the telephone, what RESPONSE TIME would you find acceptable, and what time (on average and in working hours) have you experienced over the last twelve months? (Take RESPONSE TIME to mean from the time the problem is reported to the arrival of the engineer on site.)

- Acceptable _____ Hours
- Experienced _____ Hours

17. If FIX TIME is defined as the time taken to get the system software fully operational from the arrival of the engineer on site, then what time (in working hours) do you find acceptable, and what did you experience over the last twelve months?

- Acceptable _____ Hours
- Experienced _____ Hours

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18. I would like to go through a list of aspects of SYSTEMS SOFTWARE SUPPORT and ask you to give an IMPORTANCE or REQUIRED rating of the aspect, a RECEIVED rating, and a SATISFACTION with service received rating for each. (Scale 1-10)

	<u>Importance/ Required</u>	<u>Received</u>	<u>Satisfaction</u>
• Software Engineer Skills Level	—	—	—
• Software Documentation	—	—	—
• Software Installation	—	—	—
• Provision of Updates	—	—	—
• Operational Training	—	—	—
• Software Remote Support	—	—	—
• Software Support Overall	—	—	—

19. If possible, I would like you to provide some information on systems software support pricing.

a) What percentage price increase or decrease did you pay for systems software support in the year 1990?

- Increase _____ %
- Decrease _____ %
- No Change Y/N (Circle)

b) What do you expect the changes for systems software support to be in the future, in percentage terms per year?

- Increase _____ %
- Decrease _____ %
- No Change Y/N (Circle)

D. ANCILLARY SERVICES

I would like to discuss with you now services beyond normal maintenance. I am particularly interested in obtaining your views on other services or modified current service offerings that your service suppliers could provide that would help to improve the running of your computer systems.

20. On a scale of 1-10, could you rate your requirement for these services and what you are now receiving. (Scale 1-10, not required/receiving = 0)

	(a) Require (1-10)	(b) Received (1-10)
• Configuration Planning	_____	_____
• Capacity Planning	_____	_____
• Environmental Planning	_____	_____
• Cabling	_____	_____
• Software Evaluation	_____	_____
• Maintenance-Related Training	_____	_____
• Installation/Deinstallation/Moves	_____	_____
• Consulting	_____	_____
• Network Planning	_____	_____
• Network Management	_____	_____
• Disaster Recovery	_____	_____
• Facilities Management	_____	_____
• Problem Management	_____	_____
• Applications Software Support	_____	_____

21. How important is it that your service vendor communicates with you regularly and effectively to advise you of, for example:

- The status of your system
- Possible problems
- Repair plans
- Availability of spare parts
- Routine visits
- Hardware and software changes

Could you please rate your requirement for this communication on a scale of 1 to 10 where 1 indicates a low requirement or communication received and 10 is a high requirement or communication received.

- Required _____
- Received _____

22a. Do you currently receive any of the following multivendor services from your service provider? (Circle)

- a. Service on other manufacturers' CPUs? Y/N
- b. Service on other manufacturers' peripherals? Y/N
- c. Service on other manufacturers' network products? Y/N

22b. Please rate on a scale of 1-5 how important these services would be in the next three years for you. (1 = no interest and 5 = high interest)

(1-5)

- a. Service on other manufacturers' CPUs? _____
- b. Service on other manufacturers' peripherals? _____
- c. Service on other manufacturers' network products? _____

22c. On a scale of 1-5, what would be your level of interest in a single-point-of-contact service arrangement?

(1 = no interest, 5 = high interest) _____

23a. Do you currently receive any of the following discounts off your service pricing?

23b. For those not receiving, what is your level of interest in these discounts?

	(a) Y/N	(b) LOI (1-10)
Multiyear	_____	_____
Prepayment	_____	_____
Call Screening/ Problem Management	_____	_____
Deferred Response	_____	_____
Other	_____	_____

24. To wrap this up, may I ask what you would consider to be your single most pressing service concern at this time?

25. And, if you could choose one additional service that your vendor is not currently providing, what would that be?



This completes the questionnaire. I would like to thank you on behalf of INPUT for helping us to complete this survey. To express our appreciation for your time, we will be sending you a "Thank You" package containing a summary of the results from our survey. To make sure you receive your complimentary report summary, let me check the spelling of your name and the address information. (Confirm and record on cover sheet.)

